

**GOVERNMENT OF THE
GOLD COAST.**

REPORT

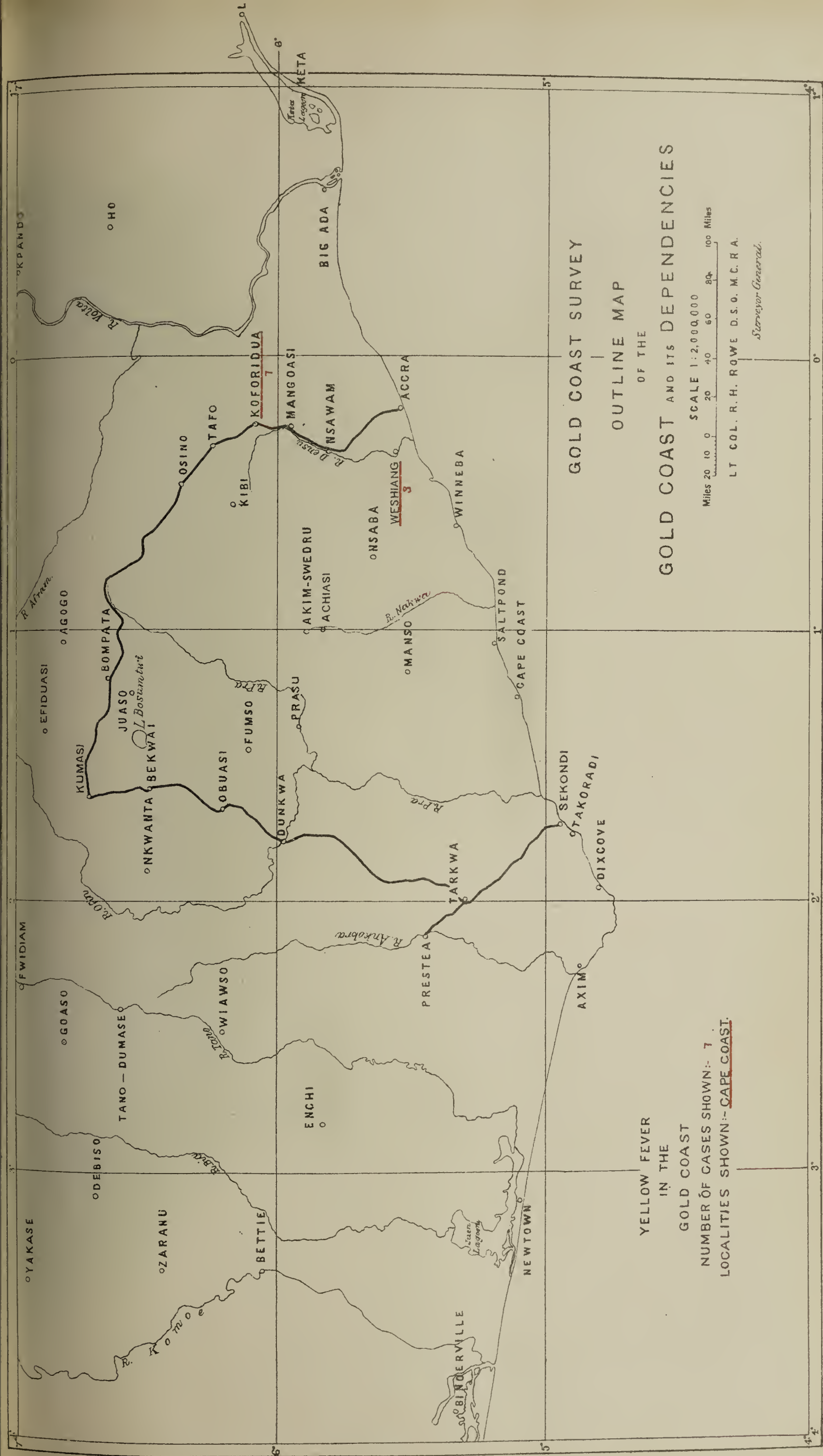
ON THE

**MEDICAL AND SANITARY
DEPARTMENT**

FOR THE PERIOD

APRIL, 1924—MARCH, 1925.

*Printed by the Government Printer at the Government Printing Department, Accra.
To be purchased from the Colonial Secretariat, Accra, Gold Coast Colony, and from the
Crown Agents for the Colonies, 4, Millbank, London, S.W. 1.
Price 3s. 6d.*



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FOR THE PERIOD

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4243

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I. ADMINISTRATION.

TABLE I.—MEDICAL STAFF AT 31ST MARCH, 1925.

- 1 Director of Medical and Sanitary Services.
- 1 Deputy Director of Medical and Sanitary Services.
- 1 Deputy Director of Sanitary Services.
- 1 Director of Medical Research Institute.
- 2 Assistant Directors of Medical Service.
- 1 Surgical Specialist.
- 2 Medical Specialists.
- 6 Senior Medical Officers.
- 2 Senior Sanitary Officers.
- 2 Pathologists (1 seconded from the R.A.M.C.)
- 29 Medical Officers (four of whom are Medical Officers of Health).
(Two Medical Officers of Health seconded from the R.A.M.C.).
- 2 Women Medical Officers.
- 2 African Medical Officers.
- 1 Junior African Medical Officer.
- 13 Vacancies :—
 - 7 Medical Officers.
 - 3 Medical Officers of Health.
 - 1 Woman Medical Officer.
 - 1 African Medical Officer.
 - 1 Junior African Medical Officer.
- 1 Dental Surgeon.
- 1 Analytical Chemist.
- 1 Office Assistant and Accountant.
- 1 Medical Storekeeper.
- 1 Secretary, Gold Coast Hospital.
- 1 Dispensers Instructor.
- 1 Radiographer.
- 7 Superintending Sanitary Inspectors (Five Superintending Sanitary Inspectors seconded from the R.A.M.C.).
- 1 Laboratory Superintendent.
- 1 Laboratory Assistant.

EUROPEAN NURSING STAFF.

- 4 Senior Nursing Sisters.
- 14 Nursing Sisters.

PRINCIPAL MEMBERS OF THE SUBORDINATE STAFF OF :—

- (a) Medical Department.
- (b) Sanitation Branch.
- (c) Lunatic Asylum.

- (A) 2 Chief Dispensers.
- 6 First Division Dispensers.
- 3 First Division Nurses.
- 1 Chief Clerk.
- 1 First Division Clerk.
- (B) 1 Chief Clerk.
- 1 First Division Clerk.
- 1 Sanitary Inspector and Training Officer.
- 1 Senior Division Sanitary Inspector.
- 4 First Division Sanitary Inspectors.
- (C) 1 Chief Attendant.
- 1 Assistant Attendant.
- 1 Matron.

ADMINISTRATION.

(a) EUROPEAN STAFF.

Promotions.

Dr. G. Hungerford was promoted Deputy Director of Medical and Sanitary Services in place of Dr. O'Dea, from 13th June, 1923 and arrived in the Colony on 15th October, 1924.

Drs. H. W. Gush and G. J. W. Keigwin were promoted Senior Medical Officers on 8th May, 1924 and 27th June, 1924 respectively.

Dr. E. M. Franklin was promoted Senior Medical Officer and arrived in the Colony on 22nd January, 1925.

Drs. H. T. Palmer and J. C. S. MacDouall were promoted Assistant Directors of Medical Service, Nigeria and left the Colony on 24th July, 1924 and 29th October, 1924 respectively.

Miss G. M. Murphy promoted Senior Nursing Sister, from 27th March, 1925 and arrived in the Colony 28th March, 1925.

Appointments.

Drs. H. L. Mooney, A. G. MacKay, G. F. T. Saunders, G. Robinson and M. DeBono were appointed Medical Officers during the year.

Mr. L. M. Forsyth was appointed Radiographer and Mechanic.

Sgt. C. J. Price was appointed Dispensers Instructor.

Mr. C. N. C. Field was appointed Secretary, Gold Coast Hospital in place of Mr. G. Duerden, Wardmaster, Gold Coast Hospital, owing to the abolition of the latter post.

Two Women Medical Officers for Infant Welfare Clinic, Drs. Nora A. Robinson and Anna M. K. O'Halloran were appointed in October and November, 1924.

Misses C. G. Leggat, M. L. Brown and M. K. Parr were appointed Nursing Sisters.

Dr. G. J. D. Hammond was appointed Junior African Medical Officer.

Retirements, Resignations and Deaths.

Dr. H. E. Arbuckle, Senior Medical Officer, retired on Pension on 20th September, 1924.

Miss F. M. Day, Senior Nursing Sister, retired on Pension on 13th February, 1925.

Dr. C. A. Calder, Medical Officer, resigned on 13th December, 1924.

Miss V. P. Peet, Nursing Sister resigned on 23rd July, 1924.

Dr. H. L. Mooney, Medical Officer, appointment terminated 28th March, 1925.

Mr. H. Duerden, Wardmaster, appointment terminated 11th May, 1925.

Miss S. E. Turner, Nursing Sister, appointment Terminated at the end of her leave.

Miss J. Roberts, Nursing Sister, appointment terminated 15th May, 1924.

Miss L. Sutton, Nursing Sister, appointment terminated 29th September, 1924.

Dr. W. H. Simmons, Medical Officer, died in the Colony on 11th June, 1924.

Dr. P. A. T. Sneath, Medical Officer, transferred to Sanitation Branch on 27th June, 1924. as Medical Officer of Health.

(b) AFRICAN STAFF.

Appointments and Promotions.

Messrs. D. H. Reindorf, S. L. C. Barrow, E. B. N. Antonio and C. C. Chinery were promoted 2nd Division Dispensers on their being successful at the Druggists' Examination held during the year.

Three Attendants were appointed to the Lunatic Asylum.

Nineteen Nurses-in-Training were promoted to the 2nd Division during the year.

TABLE 2.—FINANCIAL.(a) *Statement of Revenue 1st April, 1924 to 31st March, 1925.*

Revenue (Hospital Fees)	..	..	..	..	£4,462	4	1
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(b) *Statement of Expenditure.*

Medical Department (including Sanitary Branch)—

Personal Emoluments	..	..	..	..	£110,943	1	0
Other Charges	..	..	..	..	146,207	7	9

Total	..	..	..	..	£257,150	8	9
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II. PUBLIC HEALTH.

(a) GENERAL REMARKS.

(3) The following Table shews the most noteworthy contrasts in the Returns of Diseases treated during the years 1922-23, 1923-24 and for the period under review :—

Disease.				1922-23.	1923-24.	1924-25.
Small-pox	..	..	..	3	2	19†
Chicken-pox	..	..	..	212	295	211
Dysentery	..	..	..	908	551	693
Enteric Fever	..	..	..	19	36	31
Influenza	..	..	..	243	193	246
Malaria :—						
Tertian	..	..	..	2,341	786	1,218
Quartan	..	..	..	101	78	276
Subtertian	..	..	..	1,371	2,041	1,427
Chronic	..	..	..	1,865	543	1,108
Blackwater	..	..	..	48	21	16
Unclassified	..	..	..	1,780	2,494	1,171
Measles	..	..	..	182	88	22
Pneumonia	..	..	..	599	534	514
Rheumatic Fever	..	..	..	132	109	10
Sleeping Sickness	..	..	..	15	6	26
Whooping Cough	..	..	..	379	193	35
Alcoholism	..	..	..	14	34	28
Yellow Fever	..	..	..	22	13*	10
Tuberculosis	..	..	..	385	411	414
Plague	..	..	..	1	44	342

† Refers only to cases treated in recognized Hospitals.

* Includes four suspicious cases among Africans.

4. **Dysentery.**—Shows an increase of 142 over last year's figures the total being 693 as compared with 551. 311 of the Amoebic type ; 211 of the Bacillary and 171 Unclassified. Infected flies and contaminated food—the former being responsible for the latter in the majority of cases—are no doubt responsible for a large percentage of the cases of dysentery, but it is interesting to note the figures pertaining to the three towns Accra, Sekondi and Kumasi—at Accra and Sekondi the water supply is pipe-borne at Kumasi the supply is from wells and tanks :—

	(Pop.)	Amoebic Dysentery.	Bacillary Dysentery.	Total.
Accra	.. 48,429	27	9	36
Sekondi	.. 14,437	31	1	32
Kumasi	.. 26,036	80	26	106

This goes to show how important it is that every large town should have a pipe-borne water supply.

5. **Malaria.**—A slight decrease is shewn in the number of cases of Malaria and fevers of Malarial origin under which heading are also included Blackwater and Unclassified fevers. The total cases for the previous year was 5,963 as against 5,216 for this year. It is gratifying to note that those fevers labelled unclassified have declined by over 50 per cent., only 1,171 being recorded as against 2,494 of last year. 'Unclassified' fever is always an unsatisfactory diagnosis to have to make though in many instances it is unavoidable especially in remote stations where the Medical Officer does not enjoy all the facilities available at Headquarter Stations.

6. **Blackwater.**—Since 1922-23 there has been a slow decline in this formidable disease as will be observed by the figures recorded.

Dr. Young, Director of Medical Research Institute has furnished in his Report which is attached as an Appendix a most interesting discussion on the etiology of Blackwater Fever—which to very briefly summarize plays round the maxim—"No Blackwater occurs without initial attacks of Malaria. All Blackwater should be treated on the same lines as Malaria and given quinine." Many weighty arguments are put forward by Dr. Young and compelling facts marshalled together, but all the same it must be remembered that the origin of Blackwater fever is not yet conclusively known, and we cannot afford to indulge in any extreme measure of cocksureness as to the origin of a disease which has puzzled, and continues to puzzle, some of the greatest authorities on Tropical Diseases.

7. **Yellow Fever.**—Ten cases occurred as against 13 of last year. Of these ten* cases six were Europeans of whom four died, three Syrians all of whom died† and one African who recovered.

*Includes one doubtful case.

†Includes two cases which were at first diagnosed as Haemoglobinuria and Bilious Remittent Fever but which were in all probability Yellow Fever.

Appendix D. contains the history of two of the above cases which were more interesting clinically than the others.

8. *Tuberculosis*.—The numbers closely approximate to last year's figures, *i.e.*, 414 as against 411. Death 51 as against 64 for previous year.

9. *Smallpox*.—The greatly increased incidence of Smallpox over the previous three years is a subject of considerable interest. The disease lay more or less latent from 1922 to 1924. During the 1924-25 period 406 cases were reported with a mortality of 7.6. p.c.

By far the greater number of cases occurred in Ashanti and the Northern Territories, the total in these areas being 396 as against 10 reported in the Colony.

The differential diagnosis between Chicken Pox and Smallpox still forms a great stumbling block in the way of accurate figures, as it is obvious that if an undoubted case of smallpox occurs, all, even remotely suspicious cases, have to be treated with the same rigour for the time being; so there is of necessity much overlapping between what is a very grave disease, and a disease of quite secondary importance.

One thing has now been definitely proved—though I think proof was never far absent—and that is that the natives in the Northern Territories spread Smallpox by the practice of inoculation—an ingrained habit honoured in their traditions, which it is equally hard to suppress by legislation or check by persuasion, as the inhabitants are too conservative to be easily weaned from a custom handed down to them by their ancestors.

10. *Yaws*.—Six thousand one hundred and twenty-six cases were treated during the year with a mortality of one. Good progress is being made in the treatment of this most important disease, a disease which in many of its aspects—its three stages, primary, secondary and tertiary lesions—positive Wasserman reaction in the secondary stage—and the manner in which it yields to treatment, closely resembles Syphilis and makes at times a differential diagnosis very difficult. The cases are given N.A.B., combined with prolonged mercurial treatment. This treatment to have its full value appreciated should go hand in hand with improved sanitation as cases are prone to originate in dirty houses where the virus from those suffering from Yaws impregnates the floors and walls of the filthy dwellings in which they reside, and the disease may be thus acquired without direct transference from patient to patient.

Dr. Helen Hendrie of Yendi who has worked with admirable zeal in combating the disease draws special attention to that phase or sequel of the disease known as Gangosa, or Destructive ulcerous—rhino—pharyngitis; her description is as follows:—

“The earliest symptoms noted are:—**Nose**—white discharge from the nose, “inflammation or denudation of mucus membrane over the bony nasal septum.

“**Throat**.—Inflammation or injection of anterior pillars of fauces and uvula.

“**Mouth**.—Dark blue mark at junction of the soft and hard palates.

“Dark blue markings on tongue inside of cheeks and along edge of gums.

Larynx.—A few early cases have had husky phonation or almost entire absence “of voice showing definite involvement of the larynx. Many cases after treatment have “recovered normal power of speech. The larynx is frequently involved in the later cases.

“**Progress of the Disease**.—Absence of the bony septum without outward deformity is common, involvement of the cartilaginous septum giving a peculiar tucked “in appearance to the tip of the nose, flattening of the bridge of the nose, ulceration of “the palate, simple loss of the uvula, degrees of perforation of the roof of the mouth “differing in different stages. In a few cases there has been complete loss of the palate, “nose, and the central portion of the superior maxillary bones, with ulceration proceeding “outwards on to the face. In all cases **pain** seems to be a marked early “symptom.

“Spontaneous arrestment and natural healing takes place in some cases and is “generally accompanied by cicatrization, long white string-like processes stretching from “the upper part of the faucial pillars and roof of the mouth to the sides of the pharynx “and mouth. These cases attend either for recurrence of the condition or for some other “ailment and so have been noted.

“Healing after treatment is, in all fairly early cases, complete and without deformity.”

Dr. Hendrie makes the following further interesting comments on the disease and quotes a special case :—

“While absent on the long holiday to his home one of the School boys developed “acute Gangosa. The progress of the disease must have been fairly rapid because on his “return nose, hard and soft palate, uvula, fauces, and tonsils were involved. His recovery “has been complete leaving no apparent sign. There have been histories obtained from “many cases which indicate the tendency for Gangosa to occur in certain families. “Above School boy gave a history of five other cases in his own family.

“The majority of untreated Gangosa cases develop septic pneumonia and death is inevitable.

“It has not been possible in this station to do sufficient microscopic work to arrive at any definite conclusion about the bacteriological flora generally found in these cases.

“Implication of the roots of the teeth—Following a septic osteitis of the tooth “sockets many cases have been seen in Hospital who complained of loosening of the “teeth followed by the teeth falling out. Those cases were at first treated and recorded “as ordinary cases of pyorrhoea. Later however a connection was noted between these “cases and the cases of Gangosa. The same blue line along the gums and blue markings “on the tongue and inside of mouth and palate occurring in both cases.

“Severe Amaemia is present in all cases of Gangosa. Antimony daily for a week “intravenously assists greatly in clearing up the foul-odour and producing a fresh heal- “ing surface.”

11. Syphilis.—A considerable increase in the number of cases treated—2,305 as compared with 1,311 in the previous year.

Experience of the good results of European treatment and consequently growth of confidence more than any marked increase in the disease explains the numbers—(*vide* Appendix B).

12. Leprosy.—

Nodular	..	..	65
Anæsthetic	..	..	31

Ninety-six cases as compared with 146 of last year. Again the great majority of these cases were treated in the District of Yendi, 75 out of 96.

It is notoriously difficult to get correct figures for Leprosy but there is little doubt that the disease is widespread. Special Legislation for the treatment and control of Lepers is now being considered and the founding of a large Leper Settlement discussed.

Dr. Helen Hendrie of Yendi who treats her cases with injections of Chaulmogra Oil and Thymol, given twice weekly reports the case of a Leper who after six months treatment has been discharged cured, and who is retained on the Sanitary Gang for observation. He is said to be an able bodied man and a good worker.

FIGURES FOR THE PERIOD.

13. Generally speaking the figures for the period shew an increase in the number of cases seen and treated as compared with 1923-24 as the following Table indicates. The great increase in the Death-rate is due to Plague which was responsible for 272 deaths out of the total 797.

Remaining in Hospital	1923-24	..	268
“ “	1924-25	..	519
Total cases treated	1923-24	..	77,492
“ “ “	1924-25	..	82,476
Deaths 1923-24 ..	..	..	475
“ 1924-25 ..	..	..	797
Remaining over 1923-24	..	..	519
“ “ 1924-25	..	..	467

INFANT WELFARE.

14. One of the most interesting events of the year which very directly concerns the Public Health has been the establishment of two Infant Welfare Clinics one at Christiansborg and one at James Town, in charge of Women Medical Officers. This may well mark the beginning of a new Era which has as a constructive policy the lowering of the appalling Infantile Mortality by teaching and advice both ante-natal and post-natal given to the mothers, and, by the treatment of children of all ages. Progress will necessarily be slow in a country

where it is notoriously hard to break through tradition, but with the establishment of a new building—the Princess Marie Louise Hospital for Children—now well advanced in construction, we may look forward confidently to being able to include in next year's report an account of a steady advance in this all important branch of medicine.

(b) EUROPEAN OFFICIALS.

Table shewing Sick, Invaliding and Death Rates of European Officials.

	1922-23.	1923-24.	1924-25.
Total number of Officials resident	979	994	846
Average number resident	719	689	680
Total number on the Sick List	800	792	888
Total number of days on the Sick List	7,781	6,115	8,614
Average daily number on the Sick List	21.31	16.70	23.6
Percentage of sick to average number resident	2.96	2.42	3.47
Average number of days on the Sick List for each patient	9.72	7.70	9.70
Average sick time to each resident	10.82	8.87	12.66
Total number invalided	30	32	58
Percentage of invalidings to total residents	3.06	3.21	6.85
Percentage of invalidings to average number resident	4.17	4.65	8.52
Total deaths	6	10	7
Percentage of deaths to total residents	0.61	1.00	0.82
Percentage of deaths to average number resident	0.83	1.45	1.02

NUMBER OF DAYS ON SICK LIST.

Causes.	1922-23.	1923-24	1924-25.
Tropical Diseases	3,713	2,143	3,808
Non-Tropical Diseases	4,068	3,972	4,806
Total	7,781	6,115	8,614

Causes of Invaliding of European Officials.—Neurasthenia 6, Debility 7, Chronic Malaria 5, Blackwater Fever 4, Asthma 5, Malaria AA 3, Delusions 2, Lobar Pneumonia 2, Tachycardia 2, Food poisoning 1, Presbyopia 1, Jaundice 1, Chronic Enteritis 1, Hernia 1, Gonorrhoeal Rheumatism 1, Aneurism of Aorta 1, Ulcer of Leg, 1, Syphilis 1, Chronic Nephritis 1, General injury 1, Gastric Haemorrhage 1, Pulmonary Tuberculosis 1, Eye strain 1, Dyspepsia 1, Unclassified Fever 1, Gastritis 1, Pyorrhoea 1, Haemorrhoids 1, Fracture of Leg 1, Carbuncle 1, Amoebic Dysentery 1, total 58.

The following table shews, in periods, the approximate length of tour of those invalided :—

8 months and under	18
9 to 16 months	32
17 to 21 „	8

Of the fifty-eight Officials invalided only three were military.

Invaliding rate per 1,000 1922-23	30.64
„ „ „ 1923-24	32.19
„ „ „ 1924-25	68.55

Causes of Deaths of European Officials.—Yellow Fever 3*, Cardiac Syncope 1, Bacillary Dysentery 1, Uraemia 1, Shock and Haemorrhage 1, total 7.

*One doubtful.

(c) AFRICAN OFFICIALS.

Table shewing Sick, Invaliding and Death Rates of African Officials.

	1922-23	1923-24	1924-25.
Total number of Officials resident	2,543	2,878	2,912
Average number resident	1,867	2,581	2,805
Total number on the Sick List	1,061	785	753
Total number of days on the Sick List	10,269	8,440	9,170
Average daily number on the Sick List	28.13	23.06	25.12
Percentage of sick to average number resident	1.50	0.89	0.86
Average number of days on the Sick List for each patient	9.67	10.75	12.17
Average sick time for each resident	5.50	3.27	3.26
Total number invalided	10	19	20
Percentage of invalidings to total residents	0.39	0.66	0.68
Percentage of invalidings to average number resident	0.53	0.73	0.71
Total deaths	13	16	27
Percentage of deaths to total residents	0.51	0.55	0.92
Percentage of deaths to average number resident	0.69	0.62	0.96

In the twenty cases of invalidings shewn above is included one West Indian with Pulmonary Tuberculosis.

In the twenty-seven cases of deaths shewn above is included one West Indian with Cerebral Haemorrhage.

Causes of invalidings of African Officials.—Tuberculosis (Pulmonary) 6, Tuberculosis (articular) 1, Rheumatoid Arthritis 1, General Debility 1, Chronic Nephritis 1, Spastic Paraplegia 1, Graves disease 1, Cardiac disease 2, Gangrene of foot 1, Chronic Orchitis 1, Traumatic Cataract 1, Trachoma 1, Hernia 1, Cerebral Compression 1, total 20.

Causes of Deaths of African Officials.—Tuberculosis (Pulmonary) 7, Pneumonia 7, Cardiac (Heart failure) 2, Typhoid Fever 2, Cerebral Haemorrhage 3, Malaria 1, Diabetes Mellitus 1, Gastritis 1, Erysipelas 1, Nephritis 1, unknown, no postmortem made 1, total 27.

(d) GENERAL EUROPEAN POPULATION.

(i) Government Officials	..	..	..	..	..	846
(ii) Employees of Trading Firms	..	..	..	..	..	1,482
(iii) Employees of Mining Companies	..	..	..	..	..	434
(iv) Missionaries	..	..	..	..	..	104
Total	..	..	..	..	..	2,866

Table shewing Sick, Invaliding and Death Rates of European Non-officials.

Invalided.	1922-23.				No.	Deaths.	Invalided.	Death rate per cent.	Invaliding rate per cent.
Merchants	..	..	..	..	1,410	19	29	1.34	2.05
Mining Companies	..	..	..	..	521	5	15	0.95	2.88
Missionaries	..	..	..	..	88	1	21	1.13	2.27
Totals	..	..	..	..	2,019	25	46	1.23	2.27
1923-24.									
Merchants	..	..	..	..	1,425	11	25	0.77	1.75
Mining Companies	..	..	..	..	527	2	28	0.37	5.31
Missionaries	..	..	..	..	97	1	2	1.03	2.06
Totals	..	..	..	..	2,049	14	55	0.68	2.68
1924-25.									
Merchants	..	..	..	..	1,482	11	42	0.74	2.83
Mining Companies	..	..	..	..	434	1	16	0.23	3.68
Missionaries	..	..	..	..	104	—	8	—	7.69
Totals	..	..	..	..	2,020	12	66	0.59	3.26

Causes of Invaliding of European Non-officials.—General Debility 12, Chronic Malaria 7, Yellow Fever 4, Blackwater Fever 4, Neurasthenia 4, Typhoid Fever 3, Gastritis 3, Pneumonia 2, Insolation 2, Hepatitis 2, Nephritis 1, Gluteal Abscess 1, Pulmonary Tuberculosis 1, Inguinal Hernia 1, Hypochondriasis 1, Displaced Cartilage knee 1, Delusional Insanity 1, Multiple Abscess 1, Bubo 1—Malaria AA 1, Tertian Malaria 1, Bubonic Plague 1, Paratyphoid 1, Renal Calculus 1, Prostatitis 1, Hepatic Abscess 1, Cardiac Disease 1, Gonorrheal Rheumatism 1, Cheiropompholix 1, Septicaemia 1, Graves Diseases 1, Unknown 1, Cellulitis 1, total 66.

Causes of Deaths of European Non-officials.—Yellow Fever 4, Blackwater Fever 2, Malaria 2, Cardiac Disease 1, Influenza 1, Peritonitis 1, Alchohoism 1, total 12.

European Mortality and Invaliding Rates for the year :—

Class.	No.				Deaths.	Invalidings.	Death Rate per 1,000.	Invaliding Rate per 1,000.
Officials	..	..	..	..	846	7	58	8.27
Non-officials	..	..	..	..	2,020	12	66	5.94
Totals	..	..	..	..	2,866	19	124	6.62

ANNUAL SANITARY REPORT 1924-1925.

III.—SANITATION.

A.—GENERAL REVIEW OF WORK DONE, LAWS PASSED AND PROGRESS MADE

(I.)—ADMINISTRATIVE.

(a) EUROPEAN STAFF.

Dr. G. J. Pirie, Deputy Director of Sanitary Services, proceeded on leave on 5th July, 1924, and resumed duty on 22nd January, 1925.

Dr. A. C. Lorena, Senior Sanitary Officer, proceeded on leave on 26th April, 1924, and retired on pension on 10th October, 1924.

Dr. W. G. Watt, Senior Sanitary Officer, returned from leave on 2nd April, 1924.

Dr. T. A. Dowse, Medical Officer of Health, who proceeded on leave on 17th September, 1924, was promoted Senior Sanitary Officer and transferred to Nigeria.

Dr. G. C. M. Davies, proceeded on leave on 21st December, 1924.

Dr. P. S. Selwyn-Clarke, resumed duty after leave on 28th May, 1924, and was promoted Senior Sanitary Officer, Gold Coast on 11th October, 1924.

Dr. J. A. A. Duncan, proceeded on leave on 26th November, 1924.

The promotion of Dr. T. A. Dowse and Dr. P. S. Selwyn Clarke increased the vacancies in the Medical Officer of Health grade to five.

One of these vacancies was filled towards the end of the year by the transfer of Dr. H. C. E. Quin from the East African Medical Service. Dr. Quin assumed duty on 4th February, 1925.

A second vacancy was filled by the appointment of Dr. P. A. T. Sneath, Medical Officer, as Medical Officer of Health, and he resumed duty on 18th March, 1925.

Superintending Sanitary Inspectors (European)—Seven appointments were approved in the 1924-1925 Estimates. The two vacancies remaining when the year began were filled as from May 28th.

Owing to the outbreaks of Plague at Sekondi and Kumasi and the shortage of the Sanitary Staff a party consisting of Major M. D. Ahern and Major A. L. Otway, Hygienists, and Major C. M. Ingoldby, Pathologist, and six non-commissioned officers of the Royal Army Medical Corps was sent out on special Plague duty.

All the party except Major Ahern assumed duty on 22nd October, 1924. Major Ahern arrived in the Colony on 26th November. One of the non-commissioned officers Sergeant R. Hellowell was invalided on 4th January, 1925, and died in England on 20th January, 1925.

(b) AFRICAN STAFF.

The appointments of two second Division Sanitary Inspectors (Messrs. A. S. Williams and S. K. Osei were terminated.

Mr. J. M. Eshun, 2nd Division Sanitary Inspector was invalided.

B. A. Odoom, Vaccinator, and J. C. M. Stoph, Sexton, were dismissed the service.

There were 67 African Sanitary Inspectors—one Senior Division, one Sanitary Inspector and Training Officer, four First Division, fifty-nine 2nd Division, and two female Sanitary Inspectors. With the exception of short leave periods all were on duty throughout the year.

In addition the above ten temporary Sanitary Inspectors were employed on plague duties at Sekondi and Kumasi.

Provision was made in the estimates for ten Sanitary Inspectors in training. The period of training will be three years instead of a few months as formerly. At least one year of the training period will be spent in Accra.

The following places were visited by the Deputy Director of Sanitary Services or a Senior Sanitary Officer during the year :—Nsawam, Winneba, Saltpond, Cape Coast, Sekondi, Tarkwa, Abosso, Huni Valley, Kumasi, Keta, Ada, Akuse, Dodowa and Weshiang. Many of these places were visited two or three times during the year.

ORDINANCES, ETC.

The following are the principal changes—

Ordinance No. 16 of 1924 amending the Infectious Diseases Ordinance by adding a section empowering the Governor to make regulations for the better control of any disease of a communicable nature.

Regulation No. 12 of 1924 under the Quarantine Ordinance defining more clearly the procedure to be followed by the Visiting Officer and Health Officer with respect to an Infected, suspected ship or ship from an infected place.

Regulation No. 22 of 1924 under the Infectious Diseases Ordinance dealing with Relapsing Fever.

Various orders in council applying the Towns and Public Health Ordinance to or declaring Health areas in the following towns ; Koforidua, Swedru, Takoradi Harbour and town, Keta, Enchi, Asin Fosu, Bosusu.

Various orders were made by the Governor under the Quarantine and Infectious Diseases Ordinance declaring certain places Infected by reason of Infectious Disease and revoking the same.

II.—PREVENTIVE MEASURES AGAINST.

(i) INSECT BORNE DISEASE.

Malaria, yellow fever, etc., the routine anti-mosquito work has been carried out during the year by the Sanitary Staff. Reclamation and drainage of low lying swampy areas, conversion of earth drains to cement drains, bush clearing, etc., were continued during the year.

In Kumasi in particular great improvements were accomplished by these measures.

In addition the routine anti-mosquito work was carried out by the Sanitary Staff.

Dr. Mary Magill who was School Medical Officer at Accra resigned and left the Colony on 22nd March, 1924, and as there was no Medical Officer available to take her place the routine inspection of school children was interrupted.

Dr. Nora A. Robinson arrived in Accra on 29th October, 1924, and Dr. Kathleen O'Halloran on 26th November, 1924, and routine inspection of school children was again commenced at Christiansborg when the schools re-opened after the Christmas and new year vacation.

In Accra returns of school children examined are only available for February and March of the year under review. During these months 476 school children were examined and in 261 of these, pathological conditions were found.

The commonest conditions were enlarged spleens and pathological states of skin, mouth and teeth and glands.

In Kumasi 1,802 children were examined by the Medical Officer of Health during the year.—Of these 588 = a percentage of 30.9 were found to be suffering from malarial spleens.

Yellow Fever.—During the year outbreaks of yellow fever occurred at Weshiang and Koforidua.

Weshiang is a village about 12 miles from Accra with which it is connected by light railway. The Accra Water Works are established near this village. The first case was a European employed at the water works who took ill on 16th May, 1924. He was removed to the European Hospital Accra on 17th May, 1924, and died on 20th May, 1924.

A second case a European also employed at the Water Works took ill on 20th May, 1924, was removed to the European Hospital, Accra and died on 23rd May, 1924.

A third case a native, (a Police Constable) took ill on 29th May, 1924. He recovered. Weshiang had been declared an Infected area and this constable was one of some additional police who had been sent from Accra to assist in the control of persons leaving Weshiang by road. He was billeted with other police in a shed near the power station at Weshiang and must have been infected immediately after his arrival in Weshiang. Two other Europeans of the water works staff resident at Weshiang were inoculated with Noguchi vaccine and remained in Weshiang in charge of the power and pumping plant. They did not contract the disease. All the native contacts were removed to the Contagious Diseases Hospital at Labadi and segregated there.

A Medical Officer and additional Sanitary Inspectors were sent to Weshiang. It has always been found extremely difficult to keep this station free from mosquito breeding places owing to its situation on the banks of a small river. At one part the power-works are separated from the river by a large flat expanse of land covered with coarse grass which is subject to periodic flooding when the river overflows its banks. The area was however dealt with as far as possible, but is still liable to flooding. At the time of the outbreak the construction of a weir across the river to dam back the water and facilitate pumping, had been commenced. It is not yet certain what effect this will have on the flooding of the area. One unusual breeding place was discovered and dealt with namely the water works laboratory. This laboratory was only used at intervals and when not in use was locked up and the key taken away. Mosquitoes were found breeding in large numbers in the laboratory dishes and utensils which had become filled with water dropping from a generally leaking roof. It has now been arranged that the key be kept at Weshiang so that the Inspector can get regular access to the building.

Old machinery dumps had also to be dealt with and as there was no covered place to store them special measures had to be taken to prevent rain water being retained.

Outbreak at Koforidua. On 26th October two Europeans reported sick at Koforidua both showing the following symptoms, high temperature, slowing pulse and albuminuria. The next day at Accra a Syrian who had come to Accra from Koforidua a few days before died in Accra in Hospital and the cause of death was reported to be Yellow Fever. This Syrian had been living in a house at Koforidua near the office used daily by the two Europeans referred to above. The investigations consequent on the death of the Syrian in Accra brought to light the fact that two other Syrians had died in the same house at Koforidua on 4th and 10th of the same month and these had been certified and registered as Hæmoglobunuria and Bilious Remittent Fever respectively. The two Europeans referred to above were diagnosed as Yellow Fever. One died on 2nd November and the other recovered.

Additional Sanitary Staff was sent to Koforidua and all the usual precautionary measures were taken. Noguchi vaccination was offered to all European and many came up for vaccination.

A third European was taken ill at Koforidua on 17th November and died on the 20th of undoubted yellow fever.

A fourth European was taken ill on 10th November. He recovered. This man had been inoculated with Noguchi vaccine on 1st November, and again on 6th November, 1924. He complained of his inoculated arm which had swollen. His temperature was 101 F and pulse 100. Next day his temperature went up to 102.5 his pulse fell to 60 and there was albumen in his urine. By the third day he had improved and his convalescence was uneventful. The Senior Medical Officer, Koforidua, in his report states that this interesting case should be treated as one of mild Yellow Fever.

The Acting Deputy Director of Sanitary Services when reporting on the outbreak states "It is doubtful if the two Syrian deaths on 4th and 10th October were due to Yellow Fever or "not but it is rather suggestive looking back after the event."

Including these two cases and the case that was taken ill on 10th after vaccination there were altogether seven cases originating in Koforidua namely three Syrians who all died and four Europeans two of whom recovered. The first two European cases were living in the Residential area but were working in an office in the native town near the house where the Syrians lived, all the others were living in the native town.

No cases of Yellow Fever were found in Africans at Koforidua.

There are many points in the epidemiology of Yellow Fever in the Gold Coast which require to be more fully investigated. The disease in the Gold Coast African is extremely mild and very difficult if not impossible to diagnose with certainty. What usually happens is Yellow Fever is diagnosed first in a European and then cases of doubtful illness in the African are looked on as possible Yellow Fever. The only exception is the Kroomen who are not natives of the Gold Coast, in them the disease runs a more typical course and is more easily recognised.

If the source of infection be the African is the principal reservoir in the children or in the adults or in both? The immunity or partial immunity of the adult might be explained by assuming an attack in childhood, but Yellow Fever has not yet been definitely recognised in African children. The whole Medical problem of diagnosis in the African is difficult and, owing to that, preventive measures are made less effective and limited to a great extent to reduction of the mosquito carriers. The complete elimination of *stegomyia* is not possible in communities where storage of water in receptacles in houses and compounds is still necessary.

Whether the disease be true Yellow Fever or not the very high mortality it causes among non-immunes (Europeans and Syrians), impresses the necessity for further investigation.

In connection with this it might be stated that in 1923 the International Health Board, New York, offered to form a Commission to visit the Gold Coast and stay at least two years. At that time the date of despatch of this expedition could not be fixed as the Rockefeller Foundation were not in a position to withdraw their yellow fever experts from Brazil. This offer was accepted.

In my opinion an expedition, such as the above, composed of skilled investigators prepared to stay in the Gold Coast for several years if necessary, could do a great deal to clear up many of the obscure problems associated with Yellow Fever in the Gold Coast.

Trypanosomiasis.—There are no definite figures relative to the incidence of trypanosomiasis in the Gold Coast. Dr. Young, Director of the Medical Research Institute, in his report on tsetse fly and trypanosomiasis in Ashanti states that “sleeping sickness is by no means a rare disease in Ashanti, but it is undoubtedly chronic and probably many spontaneous recoveries take place.”

The Medical Officer at Wa in the Northern Territories in a report on the incidence of sleeping sickness in the Lorha District concludes that sleeping sickness though not uncommon is not on the increase. The diagnosis of the cases however lacks confirmatory laboratory evidence.

(2) INFECTIOUS AND EPIDEMIC DISEASES.

Enteric Fever.—Six cases of this disease were reported at Kumasi during the year. Four of these occurred in March, only one of whom, a European, recovered. These cases occurred during a period of drought and the water supplies might conceivably be responsible for the outbreak, but there is no definite evidence. One doubtful case was reported at Cape Coast in January in a European.

Dysentery.—prevails throughout the Colony; 251 cases with 32 deaths were reported during the year. In Ashanti and Northern Territories 40 cases were reported by the Medical Officers. All the 40 cases recovered.

In Accra 77 deaths were registered as due to Dysentery and Diarrhoea.

Chickenpox.—was reported from various places in the Colony, Ashanti and Northern Territories.

Smallpox and Vaccination.—During the year considerable outbreaks of Smallpox were reported. In Northern Territories 285 cases with 25 deaths and in Ashanti 111 cases with six deaths were reported; the mortality in the former being 8.7% and in the latter 5.4% 10 cases were reported in the Colony. The greater proportion of the cases in Ashanti and Northern Territories occurred along the western caravan routes.

Dr. MacRae who was sent to deal with the smallpox outbreak in the Malwe and Bole areas in Northern Territories states that smallpox is a well known disease among the inhabitants who practice inoculation by scarifying and inoculating the back of the wrist with pustular material from a case of smallpox.

Inoculation is prohibited under the Vaccination Ordinance, but it is impossible in isolated and distant parts of the Gold Coast entirely to prevent it. There is little doubt that extensive spreading of smallpox in some areas is primarily due to the native practice of inoculation.

Vaccination is carried on generally, and is compulsory in all the larger coast towns, and can be made compulsory when necessary in any area by an order in council under section 5 of the Vaccination Ordinance.

Eight vaccinators were continuously employed and other suitable persons were engaged and trained to vaccinate when required.

VACCINATION 1919 to 1924-25.

	1919	1920	1921	1922	1923-24	1924-25
Total Vaccination	21,467	221,386	87,449	122,566	82,425	102,546
Total verified successful ..	16,943	177,085	58,073	46,588	36,468	45,163
Percentage verified successful	78.9	80	66.4	38.01	44.24	44.04

Relapsing Fever.—13 cases were reported during the year. All the reported cases occurred in the Colony. Relapsing Fever has been removed from the list of Infectious diseases declared as such under the Infectious Diseases Ordinance. A new section was added to the Infectious Diseases Ordinance by Ordinance No. 16 of 1924 empowering the Governor to make regulations for the better control of any disease of a communicable nature. Under this new section Relapsing Fever Regulations were passed giving the Medical Officer of Health all the powers necessary for dealing with Relapsing Fever. During the year however there were no important outbreaks of this disease.

Plague—First Outbreak at Sekondi.—The first outbreak of Plague at Sekondi began in March, 1924 and continued up to May of the year under review. From the 1st April to the end of this outbreak 52 new cases were reported giving a total number of 96 cases for the whole outbreak. Of this total 68 died; a case mortality of 70.7%. Excluding the European case which occurred in the previous March and recovered, the case mortality among Africans was 71.5%.

Second Outbreak at Sekondi.—Sekondi remained free of Plague till the end of June, 1924, when two fresh cases were reported on the 30th June and 1st July respectively. The town was again declared Infected by Orders by the Governor under the Infectious Diseases and Quarantine Ordinances. The 2nd outbreak lasted till the 19th July and altogether 26 cases were reported of whom 24 died giving a case mortality of 92.3%. The most of the cases in the outbreak were of the pneumonic variety.

Outbreak of Plague at Kumasi in Ashanti.—The first case of Plague in Kumasi was reported on 2nd April and from that date till the 9th May, nine cases were reported. All died. No new cases were reported till 17th June when a fresh case was notified. From that date till 17th September, 140 cases occurred.

Kumasi was declared an infected area under the Infectious Diseases Ordinance on 27th June, and remained so till 17th September, 1924. Cases of Plague recurred in Kumasi in September, after 17th two cases; October, two cases; November, seven cases; December, four cases and March, 1925, one case.

The number of cases reported during these various outbreaks in Kumasi totalled 165 of whom 146 died giving a case mortality of 88.5%.

Outbreak of Plague at Tantom.—Tantom is a small village on the sea coast about 10 miles west of Winneba. On 28th August, the Chief of Tantom reported to the District Commissioner, Saltpond, the occurrence of an unusual number of deaths in the village among fishermen and their dependents who had returned to Tantom only a few days before from Aboasie. Aboasie is a small fishing village near Chama and is frequented by Tantom fishermen at certain times of the year. 25 definite cases of plague and two doubtful cases occurred in Tantom. All died. There were also two deaths at the small village of Agyakukwa near Tantom which were probably due to plague.

Tantom and Egyakukwa were declared Infected areas by order of the Governor under the Infectious Diseases Ordinance on 10th September, 1924. This order was revoked on 17th September.

During the year sporadic cases of Plague occurred at various places. At Cantonments 2½ miles from Accra one fatal case was reported on 7th April, 1924.

On 11th September, two cases of Plague were reported from Nkuntumpo by the Medical Officer of Health, Sekondi. Nkuntumpo is a small village 3½ miles west of Sekondi on Sekondi-Axim road. This village was declared Infected by Order under the Infectious Diseases Ordinance on 16th September. This Order was revoked on 10th October, 1924. A total of four cases occurred in this village all of which died.

On 30th September, the Medical Officer of Health, Sekondi, reported that two fatal cases of septicaemic Plague had recurred at Anaji on the 29th. Anaji is a village six miles from Sekondi on the Axim road. This village was declared Infected on 2nd October and ceased to be infected on 10th October.

No further cases occurred in this village.

On 5th March, 1925, one case of plague occurred at Cantonments near Accra.

On 11th March, 1925, one fatal case of Plague was reported at the Gold Coast Hospital.

This case, a child, had arrived sick from Koforidua the night before and had contracted the disease in Koforidua. No more cases occurred in Koforidua.

On 12th March, 1925, a Kroo woman arrived sick from Nsawam and was diagnosed at the Gold Coast Hospital as Plague. She died. No more cases were found at Nsawam. The total number of cases of Plague reported as occurring in the Gold Coast during the year under review was 273 of whom 243 died, giving a case mortality of 89.2%. If to these be added the 44 cases and 24 deaths which occurred in March of the previous year, the total cases of Plague reported on the Gold Coast from the beginning of the first outbreak in Sekondi in March, 1924, up to 31st March, 1925, is 322. Of these 272 died giving a case mortality of 84.4%.

The following table gives all outbreaks from 13th March, 1924, in order of occurrence, showing the cases classified according to predominant type:—

Place.	Date of Outbreak.	Type of Disease.			Total cases.	Total Deaths.	Case Mortality.
		Bubonic.	Pneumonic.	Septicaemic.			
Sekondi ..	March to May, 1924	90	6	—	96	68	70.7%
Kumasi ..	April to May, 1924	7	2	—	9	9	100.0%
Cantonments near Accra	April, 1924 ..	1	—	—	1	1	100.0%
Kumasi ..	June to Sept., 1924	90	26	24	140	121	86.4%
Sekondi ..	June to July, 1924	6	20	—	26	24	92.3%
Tantum ..	Aug. & Sept., 1924	—	25	—	25	25	100.0%
Nkuntumpo ..	Sept. & Oct., 1924	2	1	1	4	4	100.0%
Anaji ..	Sept. & Oct., 1924	—	—	2	2	2	100.0%
Kumasi—sporadic cases ..	Sept to Dec., 1924 and March, 1925	6	7	3	16	16	100.0%
Cantonments ..	March, 1925 ..	1	—	—	1	—	—
Koforidua ..	March, 1925 ..	—	1	—	1	1	100.0%
Nsawam ..	March, 1925 ..	—	1	—	1	1	100.0%
Totals		203	89	30	322	272	84.4%

The disease conformed in the main to the usual types. 203 cases were classed as Bubonic, 89 as Pneumonic, and 30 as Septicaemic. Many of the bubonic cases had pneumonia and the characteristic bacillus was found in smears made from the sputa during life or the lungs after death. In a few of the cases where Pneumonic characteristics predominated buboes were present.

Practically all the cases of Pneumonic and Septicaemic Plague died.

It is doubtful if the cases returned as Pneumonic were genuine pneumonic plague as several instances came under my observation in Sekondi (referred to in my report on the first outbreak of plague there in 1924) where healthy persons coming into close contact with Pneumonic cases did not contract the disease.

In this connection it is interesting to note that in the first outbreak at Sekondi 93.8% of the cases were bubonic and only 6.2% were classed as Pneumonic. The case mortality in this outbreak was 70.7%. In the later outbreaks at Kumasi, Sekondi and Tantum the proportions were as follows—

In Kumasi outbreak 64.2% Bubonic and 35.8% Pneumonic and Septicaemic, the case mortality all cases being 86.4%.

2nd outbreak Sekondi only 23% of the cases were classed as bubonic while 77% were Pneumonic; the case mortality all cases being 92.3%.

In Tantum outbreak all the cases were pneumonic, and all died.

As the disease progressed the mortality increased due mainly to an increasing proportion of cases of the pneumonic and septicaemic types.

The tribes principally affected in the Kumasi and Sekondi outbreaks are shown in the table below—

SEKONDI OUTBREAK.		KUMASI OUTBREAK.	
Tribe.	Percentage of total cases.	Tribe.	Percentage of total cases.
Kroos	25%	Northern Territories ..	47.1%
Northern Territories including Fulani	18.7%	Hausa (Nigerian) ..	25.7%
Fanti	15.5%	Yoruba (Nigerian) ..	10.7%
Yoruba (Nigerian)	14.5%	Fanti	10.0%
Hausa (Nigerian)	12.5%	Fulani	3.5%

Sekondi being a port the Kroo population is much larger than that of Kumasi, while Kumasi an important railway junction and inland trade centre has a markedly greater proportion of the petty itinerant trader class of people from Northern Territories and from Nigeria. Plague flourished particularly among labourers and persons of the petty trader class, the bootless and trouserless people, who are still supremely indifferent to the fact that fresh air and cleanliness are essentials to healthy town life.

Treatment.—In the Sekondi outbreak anti-plague serum and iodine treatment were used but without success. The Medical Officer of Health Kumasi in his report on the Plague outbreak there states “judging by the experience gained during the epidemic it would appear “that anti-plague serum is of no value in primary pneumonic cases, in septicaemic cases, and “in all severe bubonic cases unless in the last mentioned the serum is administered in the early “days of the disease.”

Preventive Measures.—The preventive measures carried out in all the epidemic areas were the same as were carried out at Sekondi except that in addition in Sekondi the shipping in the port had to be dealt with. During the greater part of the Sekondi outbreak there was a shortage of anti-plague vaccine, the first consignment of which, about 1,200 doses, arrived from England on 2nd April. This consignment was used on Kroomen and Europeans and contacts. The large consignments of vaccine did not arrive till early in May when the first Sekondi outbreak ended. When the main Kumasi outbreak began there was a very large supply of vaccine in the country and vaccination in Kumasi became, in addition to the other measures, one of the principal means of combating plague. Altogether in Kumasi alone about 110,000 vaccinations were done. If to these be added the vaccinations done in other parts of the Colony the total is approximately 220,000 vaccinations. During all these outbreaks it was found that in anti-plague vaccination we have a valuable means of preventing the spread of the disease. In the Sekondi outbreaks only one person was known to have contracted plague after effective vaccination six days previously. During the 2nd outbreak in Kumasi the Medical Officer of Health in his report states “In the outbreak under review “the case incidence among vaccinated would appear to have been about one per thousand “while that among unvaccinated would appear to have been about three per thousand. Both “these figures are quite approximate.”

Full details of the measures carried out in Sekondi have already been recorded in the Report on that outbreak by the Deputy Director of Sanitary Services, and the measures as carried out in Kumasi were very fully detailed and illustrated by photographs in the report on Plague in Kumasi by the Medical Officer of Health Dr. Selwyn-Clarke.

When the plague started special anti-rat measures were instituted in all the more important towns. These measures comprised trapping alive and dead, poison, baiting and lithographic varnish. Large numbers of rats were caught but no sickness in living rats was found. Laboratory examination of rats caught showed that a certain proportion of rats were infected with plague though no signs of sickness were observable during life.

During the outbreak at Sekondi about 10% of rats examined in the laboratory were found to be infected with plague, and the Director of the Medical Research Institute reports that the only species caught was *Mus Rattus*.

In the town of Accra, where no case of human plague originated, 3.6% of rats examined in the laboratory were infected. The species caught were identified by the Director of the Medical Research Institute as *Cricetomys gambianus* 12% *Mus Rattus* 50% and *Mus Decumanus* 30%.

The Medical Officer of Health, Kumasi reports that during the Kumasi outbreak 5.3% of rats examined in the laboratory were found to be infected and the rats caught were *Rattus*, *Mus Decumanus*, and *Cricetomys gambianus*. The fleas most commonly found on rats were *Xenopsylla cheopis*.

The absence of obvious sickness in living rats which on examination in the laboratory proved to be infected with Plague is interesting. This seems to indicate that plague was not a new disease in the rats. It is difficult to explain this immunity unless it be assumed that the disease has existed in the rats in the Gold Coast for many rat generations.

By the end of the year (31st March, 1925) the Gold Coast was free from Plague and the infection in rats had practically disappeared.

Cerebro-spinal fever.—There was no serious outbreak of this disease during the year, only two fatal cases being reported from Ashanti.

Serious outbreak of fatal illness was reported on the 7th October by the District Commissioner, Goaso in Ashanti. 31 sudden deaths had occurred in the district. The Medical Officer who visited the various villages in consequence of the report, stated that the outbreak was Influenza.

(3) ENDEMIC DISEASES.

Tuberculosis.—The following deaths from Phthisis were registered at Accra 68, Cape Coast 34, Sekondi 29, Tarkwa 29.

Pulmonary Tuberculosis.—is not now a declared Infectious Disease under the Infectious Diseases Ordinance. It is notifiable by Government Medical Officers and is among the diseases that will be compulsorily notifiable in Mining Health Areas under the proposed Mining Health Areas Regulation Ordinance, 1925. These Regulations will also provide for disinfection of houses in which tuberculosis occurs. In Accra cases of tuberculosis are treated in the Gold Coast Hospital and during the year 159 cases were treated of which 147 were Phthisis.

TABLE OF DEATHS FROM TUBERCLE OF THE LUNGS IN
ACCRA DURING THE PAST 10 YEARS.

Year.	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924-25
Deaths registered	54	57	56	44	54	78	52	73	72	68

In Kumasi during the year 32 deaths were due to Pulmonary and Miliary Tuberculosis and eight to other forms of tuberculosis.

At Cape Coast 41 cases of Tuberculosis were treated during the year.

Leprosy.—No leper legislation exists in the Gold Coast. In Accra, lepers, who present themselves, are allowed to live and be treated in a series of small huts at the Contagious Diseases Hospital. They are fed free and the only condition is that they sleep in their huts at night.

During the year 24 cases of leprosy were treated by the Medical Officer of Health in the Contagious Disease Hospital, Accra—7 males and 17 females. There were no deaths.

In addition three deaths were registered in Accra as due to leprosy.

At the Contagious Diseases Hospital the weekly injection of $\frac{1}{2}$ c.c. Moogrol increasing to 5 c.c. weekly was continued. Major M. D. Ahern, R.A.M.C., the Medical Officer of Health, in his report states that there were no abscesses or other ill-effects from this treatment but adds that improvement if any in the early cases was slight and slow and there was no apparent change in advanced cases.

Dr. P. S. Selwyn-Clarke, the Medical Officer of Health, Kumasi, in his report says :—

“ It is difficult to proceed for any distance throughout the town of Kumasi without ‘encountering a leper. Fortunately for the general population the majority of these ‘unfortunate derelicts of humanity are ‘closed’ or non-infective cases but several infective cases were seen, most being of Hausa or Northern Territory nationality. It is a ‘matter of considerable regret that no legislation exists to enforce compulsory ‘segregation in a satisfactory leper Colony.”

On the advice of Sir Leonard Rogers, Dr. Selwyn-Clarke brought out a quantity of a 3% sterile solution of Sodium Morrhuate for intravenous use. He states that :—" The results so far have been inconclusive principally because no accommodation exists for lepers in Kumasi and it is essential when testing the efficiency of a drug that the patients should be kept under continuous observation. No action could be taken to prevent the spread of this disease other than the persuasion of sufferers not to share living-rooms, cooking utensils, etc., with their healthy relatives."

Dr. Helen Hendrie, the Medical Officer, Yendi, in her report states that as many of the cases of Leprosy have shown improvement under treatment with Chaulmoogro oil " it is much easier now than it was a year ago to persuade the native to remain in the leper camp." She found it difficult however to persuade the native " to remain for a long course of treatment."

HELMINTHIC DISEASES.

Ankylostomiasis.—Not much is known as to distribution of this infection among the tribes in the Gold Coast. Sir William Simpson as a result of his investigations into the causes of the high mortality among Mines labourers places first " the prevalence of ankylostomiasis which lowers the vital powers of resistance and increases the liability to disease. The ankylostomiasis is maintained and aggravated by constant reinfestation from infected latrines in the mines villages."

The medical examination of labourers recruited in Northern Territories for the mines will in time give information as to the prevalence of this infection among the tribes from which the labourers are recruited.

At the Mines special precautionary measures as recommended by Sir William Simpson are now being taken with regard to latrines both above and underground.

Tape Worm.—Is prevalent among the African population. In Accra the sterilisation of carcasses of pigs infected with cysticerci by means of Soyers stoves has been very successful.

Health of Labourers employed in Mines.

Owing to the high mortality among labourers employed on the mines in the Gold Coast, the Secretary of State appointed Sir William Simpson, C.M.G., M.D., F.R.C.P., D.P.H., to visit the Gold Coast and to examine the sanitary conditions of the mines and mines villages. Sir William Simpson arrived in July, 1924 and in his preliminary report states " I find that the high death-rate among the miners is due to the following causes :—

- " (a) The prevalence of ankylostomiasis, which lowers the vital powers of resistance and increases the liability to disease. The ankylostomiasis is maintained and aggravated by constant reinfestation from infected latrines in the mines and villages.
- " (b) A considerable proportion of unfit men and youths sent from the Northern Territories of the Gold Coast, many of whom are tuberculous and soon break down from underground work, to which they are not accustomed, and which is unsuitable for them in their condition.
- " (c) Unsatisfactory housing in the compound of Abbontiakoon allotted to Northern Territory men, although there is a well laid out new village for the local employees which could easily by extension be used for the accommodation of the Northern Territory men, care being taken that there is no overcrowding. This extension has been agreed to.
- " (d) The high death-rate in Tarquah and Abosso is due to the above-mentioned causes plus a polluted and insufficient water-supply and inadequate medical arrangements."

The remedial measures proposed by Sir William Simpson in his preliminary report in brief require :—

More effective Registration of Deaths.

Medical examination of men recruited for the mines in Northern Territories.

Improved sanitary arrangements in the Mines in the Mines villages and better supervision of same.

Improved hospital accommodation.

Inspection of Mines and Mines villages every six months by a Senior Medical Inspector of the Public Health Department.

The medical inspection of labourers recruited in Northern Territories and improvements in the sanitary arrangements at the mines are being carried out. Legislation is also under consideration to provide for better sanitary control in Mining Health Areas.

A new Births, Deaths and Burials Ordinance to take the place of the existing Ordinance is being dealt with.

In the course of his visit Sir William Simpson visited Kumasi and advised with regard to the serious outbreak of Plague in that town.

III.—GENERAL MEASURES.

Europeans.—Residential separation of Europeans is encouraged as far as practicable.

Africans.—Congested areas in towns are being dealt with.

In Accra, the congested area at Pagan Road was cleared.

In Kumasi, several congested areas were dealt with and a new Zongo was built for the accommodation of the dispossessed people.

At Koforidua, action was taken to deal with a congested area in that town.

The final plan of the layout of the new town at Takoradi is nearing completion.

The routine work was as far as possible maintained during the year by employing temporary African Sanitary Inspectors. The shortage of 2nd Division Sanitary Inspectors cannot be made up till the Sanitary Inspectors-in-training on 1st April, 1924, have passed through the three years course and become eligible for appointment as 2nd Division Sanitary Inspectors.

The total houses inspected during the year was 561,116. There were 14,144 prosecutions during the year. Of these 3,220 were for having mosquito larva in the premises, and 13,924 for other insanitary conditions. There were 3,157 convictions in cases of larvae prosecutions and 10,730 for other insanitary conditions.

The total of fines was £5,822 11s. od.

The larval index in each of the following towns was as follows :—

Accra ..	..	..	..	..	..	.6
Winneba ..	..	..	..	..	..	.4
Saltpond ..	..	..	..	..	..	.9
Cape Coast ..	..	..	..	..	..	.4
Sekondi ..	..	..	..	..	..	.18
Kumasi ..	..	..	..	..	..	.9

Markets.—In Accra, Selwyn Market was completed. Fly proof screens are provided in the meat stalls.

A new market has also been provided at the village of Achimota near Accra.

A very important improvement in Kumasi has been the reclamation of a large swampy area for a site for a new Market. The old Kumasi markets were hopelessly congested and chaotic. A certain number of market sheds have been put up on the new site, but until the ground reclaimed has settled it will not be possible to put up permanent sheds on this site.

At Cape Coast a new market at Kotokuraba is under consideration.

Disposal of Refuse.—In Accra, Major M.D. Ahern, R.A.M.C., the Medical Officer of Health, in his report states :—“ A very great advance was made during the year in doing away with the old system of mule transport and substituting motor lorries for the conveyance of Refuse.

“ At present there are six lorries, but another was ordered towards the end of the year “and will soon be provided.

“ The disposal of empty petrol tins is a problem and one that is likely to increase “in difficulty.

“ A baling machine to crush the tins is under order and when it is got going things in this “respect will improve.”

In Kumasi, about 14 incinerators and 20 fly-proof dustbins have been constructed and in October, 1924, motor transport of refuse from the bins to the incinerators and places of disposal was instituted.

At Sekondi, Major A. L. Otway, R.A.M.C., the Medical Officer of Health, after experimenting, has finally decided on and introduced incinerators on Field Service principles for the destruction of refuse. Motor transport is used to take the refuse from the dustbins to the 15 incinerators situated near the edge of the Lagoon which is being reclaimed. These incinerators which he describes and illustrates fully in his report are small and are simply constructed of mud, tarred on the outside and have iron fire bars four inches apart and one foot above the ground. Ventilation is provided at ground level by two openings each the size of an empty petrol tin. According to the direction of the wind one or other of these openings can be closed by simply inserting an empty petrol tin. Each incinerator has a shed for the refuse and one boy who separates the incombustible materials and the small stuff—(sand, nuts, small stones, etc.) before he throws the combustible refuse into the incinerator.

The tins and bottles etc. are removed in barrows to the area being reclaimed and the hot ashes from the incinerator, often still burning, are taken out from beneath the fire bars with a shovel and placed over the small stuff; alternating layers of small stuff and ashes thus form a heap which the barrow boys ultimately remove and deposit on the top of the tins and bottles in the area being reclaimed.

I have seen this method of incineration in operation and it works extremely, efficiently. Major Otway has experimented by means of fly-traps wooden boxes one yard square and six inches deep with a 2" hole in the centre over which is placed a large sized safety glass ink pot. These traps are placed securely on the top of the ash, etc., after disposal. Flies that may hatch out in the ash and small stuff under the trap make for the light spot (the ink bottle) and get entrapped there and can be counted. It has been found that hardly any fly breeding takes place in the areas filled with refuse treated in this way, and the areas are free from rats.

Major Otway states:—"This type of incinerator is one that is well adapted for village use as Africans are accustomed to swish (mud construction) and any headman, once shown, could make one."

Motor transport of refuse has also been introduced at Cape Coast.

Incineration of refuse has also been introduced into Bekwai and Mampong in Ashanti.

Sewage disposal.—The water carriage system at the Gold Coast Hospital, Accra, is working satisfactorily. An addition of one Imhoff tank is being made to the present installation.

In Accra and other towns the pail latrine system is in use.

Water Supply.—It has been decided to increase the Accra water supply.

The Kumasi water supply from wells and a few tanks is unsatisfactory. Approval has been given to a scheme for chlorination of the existing well water supply and for an increase of tanks at bungalows in the residential area. The day when Kumasi will have pipe borne water supply is still some way off.

Cape Coast and Koforidua Water supplies for these towns are under consideration.

The outstanding sanitary feature of the year under review has been the plague outbreaks. The extra work demanded by these outbreaks fell on a sanitary staff that was not even up to the strength required under normal conditions and for which provision had been made in the estimates. Medical Officers of the Medical Department had to be lent to the Sanitary Branch, and, finally, on the recommendation of Sir William Simpson assistance had to be obtained from the Royal Army Medical Corps.

"Prevention is better than cure," but young, keen and active Medical Officers who are the men required for the effective application of Preventive measures in African towns very naturally prefer to remain on the Medical side which holds out better prospects to officers of the above stamp,

Another feature of the year's work has been the marked progress made in the sanitary state of Kumasi. The movement towards improvement, which received its initial impetus from the outbreak of Plague, has been kept going during the year by the energy of a young Medical Officer of Health and his staff.

B. MEASURES TO SPREAD THE KNOWLEDGE OF HYGIENE AND SANITATION.

Six Africans were selected after examination and appointed Sanitary Inspectors-in-training. Four more will be appointed at the beginning of next year. The course of training is three years and it is hoped that by this means it will be possible to obtain more experienced men for appointment as 2nd Division Sanitary Inspectors. The subjects taught will pertain principally to sanitation and Hygiene, theoretical and practical, but classes in English, Arithmetic and Mensuration and Drawing are included in the course. A training in vaccination will also be included. The teaching of Hygiene has been continued in all Government and assisted schools.

Infant Welfare.—The Medical Officer of Health, Accra, in his report gives the infant mortality in Accra as 203 per 1000 births.

Two child centres have been started in Accra. The first was started by Dr. Jessie Beveridge of the Scottish Mission in June, 1924 at Christiansborg where rooms suitable for the centre were rented. In November, Dr. Nora Robinson relieved Dr. Beveridge, who then proceeded to Amedzofe in the Ho district to resume the infant welfare work she had inaugurated there her previous tour. Later when rooms suitable for a centre in James Town, a very populous part of Accra, had been obtained, Dr. Kathleen O'Halloran took over the Christiansborg centre and Dr. N. Robinson commenced infant welfare work in James Town in January. At the centres a small fee is charged for advice and treatment and the sums collected are paid into the Treasury monthly. Though these centres have been in existence for a very short time, their popularity is evidenced by the increasing number of mothers who bring their infants and children for treatment. At Christiansborg centre over 2,700 new cases were treated since June, 1924 when that centre started and in the two months February and March, 549 new cases were treated at the James Town clinic. At present only outpatients are dealt with at the centres. Next year, when the new Princess Marie Louise Children's Hospital has been built in Accra, it is intended to remove the James Town clinic to that Hospital. Two wards will be provided in the Hospital for inpatients.

There is no anti-natal clinic as yet, but quite a number of expectant mothers came up to the centres for advice and treatment.

Part of the forenoon work at the centres is the treatment of minor ailments in school children.

A weekly home nursing class is held for African ladies. In Dr. Robinson's class there are at present 14 names. A similar class is conducted for African teachers and school girls.

The Director of Education has permitted the use of the Domestic science rooms at the Government girls school for sick room cookery classes. The medical aspects of the subject are dealt with by Dr. Robinson, and Miss Telfer, the Headmistress, instructs the class in the methods of simple sick room cookery. This class has only recently been commenced.

The Medical Officer of Health, Kumasi, states that "ample scope exists (in Kumasi) for the work of a School Medical Officer whose duties would include maternity and child welfare." An educated female inspector was employed in Kumasi who, in addition to her duties as a Sanitary Inspector, acted as a health visitor and did a great deal to persuade parents to register births.

C. RECOMMENDATIONS.

1. Increase of sanitary inspectors-in-training in order to replace with trained men the temporary Inspectors at present doing duty as Sanitary Inspectors.
2. Increase of European Staff required to carry out Sir William Simpson's recommendations in respect to the inspection of Mines and to enable a Medical Officer of Health to be continuously posted to Koforidua.
3. Pipe-borne water supplies be provided for Kumasi, Cape Coast, and Koforidua.
4. Provision for segregation of Lepers.
5. Special investigation into the outbreaks of Yellow Fever in the Gold Coast.

D. ACTION TAKEN DURING THE YEAR WITH REGARD TO
RECOMMENDATIONS CONTAINED IN THE SANITARY REPORT
FOR THE YEAR, 1923-24.

1. European Residential Separation is encouraged as far as practicable.
2. Pipe-borne water supplies for Kumasi and Cape Coast still under consideration.
3. Child Welfare centres started in Accra and will be started in Sekondi when a Medical Officer is available.
4. Segregation of Lepers is under consideration.

G. J. PIRIE,
Deputy Director of Sanitary Services.

ACCRA WATER SUPPLY.

BACTERIOLOGICAL EXAMINATION OF SAMPLES FROM RESERVOIRS, FINAL FILTERS
AND TOWN STANDPIPES, APRIL 1924-MARCH, 1925.+ = Smallest volume of water yielding typical *B. coli*.— = Absence of *B. coli* in the respective volumes stated at head of columns.Adopted test of typical *B. coli*.—Lactose—positive.

Indol—positive.

Date. 1924.	Source of Sample.	100 cc	10 cc	1 cc	.1 cc	.01 cc
April	3 Final Filter No. 6	—				
	10 „ „ No. 1	—				
	„ Storage Reservoir No. 2	+	—			
	17 Final Filter No. 2	—				
	24 Standpipe at High St., opposite P. & B.	+	—			
	„ Final Filter No. 3	—				
	„ Storage Reservoir No. 2	+	—			
May	1 Final Filter No. 4	+	—			
	8 „ „ No. 4	—				
	„ Storage Reservoir No. 1	+	—			
	15 Final Filter No. 5	—				
	22 „ „ No. 6	—				
	„ Storage Reservoir	+	—			
	29 Final Filter No. 1	—				
June	5 Standpipe Horse Road	+	—			
	„ Raw Water Tank	+	—			
	„ Final Filter No. 2.	—				
	12 „ „ No. 3	+	—			
	19 Standpipe Derby Avenue	—				
	„ Final Filter No. 4	+	—			
	„ Low Level Reservoir No. 1	+	—			
	26 Final Filter No. 5	—				
July	3 Standpipe at Horse Road	+	—			
	„ Final Filter No. 6	—				
	„ Low Level Reservoir No. 2	+	—			
	10 Final Filter No. 1	—				
	„ Standpipe at Horse Road	—				
	„ Final Filter No. 2	—				
	„ Storage Reservoir No. 1	+	—			
	24 Final Filter No. 3	—				
	31 „ „ No. 4	—				
	„ Storage Reservoir No. 2	+	—			
August	7 Final Filter No. 5	—				
	14 Storage Reservoir No. 2	—				
	„ Final Filter No. 6	—				
	21 „ „ No. 1	—				
	28 „ „ No. 2	—				
	„ Storage Reservoir No. 2	—				
September	4 Final Filter No. 3	—				
	11 „ „ No. 4	—				
	„ Storage Reservoir No. 2	—	+	—		
	18 Final Filter No. 4	—				
	25 „ „ No. 5	—				
	„ Storage Reservoir No. 2	+	—			
October	2 Final Filter No. 6	—				
	9 „ „ No. 1	—				
	„ Storage Reservoir No. 1	—				
	16 Final Filter No. 2	—				
	23 „ „ No. 3	—				
	„ Storage Reservoir No. 1	—				
	30 Final Filter No. 4	—				

Date 1924.	Source of Sample.	100 cc	10 cc	1 cc	.1 cc	.01 cc
November 6	Final Filter No. 5	—				
„	Storage Reservoir No. 1	+	—			
13	Final Filter No. 6	—				
20	„ „ No. 1	—				
„	Storage Reservoir No. 1	+	—			
27	Final Filter No. 2	+	—			
December 4	„ „ No. 3	—				
„	Storage Reservoir No. 1	0	+	—		
11	Final Filter No. 4	+	—			
18	„ „ No. 5	+	—			
„	Storage Reservoir No. 2	—				
25	Final Filter No. 6	—				
January 2	„ „ No. 1	—				
„	Storage Reservoir No. 2	+	—			
8	Final Filter No. 2	—				
15	„ „ No. 3	—				
„	Storage Reservoir No. 2	0	+	—		
22	Final Filter No. 4	—				
29	„ „ No. 5	—				
„	Storage Reservoir No. 2	0	+	—		
February 5	Final Filter No. 6	—				
12	„ „ No. 1	0	+	—		
„	Storage Reservoir No. 1	+	—			
14	Laboratory Tap	—				
19	„ „	—				
„	Final Filter No. 2	—				
26	Storage Reservoir No. 1	+	—			
„	Final Filter No. 1	—				
March 5	Final Filter No. 3	—				
12	Laboratory Tap	—				
„	Final Filter No. 4	+	—			
„	Storage Reservoir No. 1	—				
19	Laboratory Tap	+	—			
„	Final Filter No. 4	+	—			
26	Laboratory Tap	+	—			
„	Final Filter No. 5	—				
„	Storage Reservoir No. 1	+	—			

GOLD COAST.

(SECRETARY OF STATE No. 89 DATED 24/1/25).

TABLE SHOWING PROTECTION OF BUNGALOWS BY MOSQUITO PROOFING.

Province.	Partly protected.	Completely protected.
Western	22	Nil.
Eastern	2	„
Central	1	„
Ashanti	3	„
Accra	3	„
Northern Territories	Nil.	„
Ho	„	„

IV.—METEOROLOGY.

RAINFALL IN INCHES.

Station.					1922.	1923.	1924.
Accra	..	..	..	..	27.70	21.16	28.55
Aburi	..	..	..	..	52.09	43.14	54.14
Sekondi	..	..	..	..	46.19	39.29	42.25
Axim	..	..	..	..	60.45	90.18	61.82
Tarkwa	..	..	..	..	*58.99	71.72	73.67
Kumasi	..	..	..	..	61.95	55.75	51.96
Tamale	..	..	..	..	37.02	36.03	35.73

*Eleven months only.

V.—HOSPITALS AND DISPENSARIES.

15. The total cases treated at the various Government Hospitals and Dispensaries during the year was 82,476.

The following Table shows the number of in-patients treated at Accra, Sekondi and Kumasi Hospitals :—

Station.	1922-23.		1923-24.		1924-25.	
	Europeans.	Africans.	Europeans.	Africans.	Europeans.	Africans.
Accra	233	999	235	1,506	247	2,024
Sekondi	235	550	170	602	208	534
Kumasi	147	1,379	116	1,972	133	1,977
Totals	615	2,928	521	4,080	588	4,535

PRISONS.

16. The Prisons of the Gold Coast Colony can be divided into four classes, as follows :—

- (1) Larger prisons specially built for the purpose and of a permanent nature ;
- (2) Smaller prisons built as prisons in brick or solid swish ;
- (3) Old forts adapted for prison purposes ;
- (4) Temporary swish buildings—real “ bush prisons.”

Steady progress has been made with the new prison buildings at Ussher Fort, Accra, while at Kumasi the new Female Prison was completed and is a vast improvement on any of the former Female prisons in the Colony.

In all prisons, the prisoners sleep in association cells. In the more modern prisons the cells are mostly smaller, accommodating three prisoners, since such cells are better from the point of view of discipline and observation. This refers more particularly to Sekondi Central Prison, the new prison at Accra and the prison under construction at Kumasi. The cells at present occupied at Kumasi and cells at all the local prisons, are for the most part large cells accommodating 10 to 30 prisoners ; and these provide fair accommodation for short-sentence prisoners. There are no single cells, except for punishment or segregation ; and the single-cell system is not considered suitable for prisoners in this Colony, though at one time its introduction was contemplated.

Health.—The health of the prisoners throughout the year has been good—no serious outbreak of disease having occurred.

Diet.—The supply of food is adequate and of good quality.

Daily Lock-up.—The average daily lock-up was 1,390.57 as against 1,463.92 in 1923-24.

Sick List.—The average sick list was 43.94 *i.e.*, three per cent as compared with 3.2 in 1923-24.

Death Rate.—The number of deaths was 18 as against 32 in 1923-24.

DENTAL.

17. The Government Dentist though chiefly stationed at Accra also visited and carried out work during the year at Keta, Winneba, Saltpond, Cape Coast, Sekondi, Kumasi.

He is of opinion that there should be four dental centres, Accra, Cape Coast, Sekondi Kumasi. He inspected all the School children at these stations and reported on their dental condition as being generally good.

The number of patients treated (given in the following table) shows an increase of over 100 per cent. compared with the previous year.

				1923-24	1924-25.
A.	European Officials	..	..	252	509
	African Officials	..	..	222	436
				474	945
B.	European Non-Officials	..	..	263	420
	African Non-Officials	..	..	420	1,212
				683	1,632

The following table shows the pathological conditions met with during the year :—

	Conditions.	No.
(1)	Dental Caries	876
(2)	Dental Abscess	212
(3)	Pulpitis, Acute & Ch.	109
(4)	Periodontitis A & Ch.	97
(5)	Ex Calcific Deposit	325
(6)	Cases diagnosed as true Pyorrhoea Alveolaris (Ch. Sulphur. Periodontitis	119
(7)	Gingivitis	200
(8)	Septic Roots	150
(9)	Stomatitis	98
(10)	Sepsis arising in connection with eruption of permanent dentition	35
(11)	Malposition of Teeth	49
(12)	Fracture of Teeth	58
(13)	Necrosis of Alveolus	12
(14)	Neuralgia of non dental origin	32
(15)	Polypus of Pulp	59
(16)	Pulp stones	63
(17)	Excess post ext. haemorrhage	32
(18)	Supernumerary Teeth	57
(19)	Dental Cyst	4
(20)	Epulis	9
(21)	Fibrous Sarcoma of jaw	8
(22)	Antral disease	3

VI.—SCIENTIFIC.

18. In Appendix A will be found the Annual Report of the Medical Research Institute for the year, 1924-25 by Dr. W. A. Young.

19. Appendix B.—Extract from a Report on the work done in the Venereal Clinic Accra, by Dr. C. E. Reindorf.

20. Appendix C.—Report of the Analytical Chemist by Mr. R. Simmons.

21. Appendix D.—Reports of two cases of Yellow Fever occurring in Europeans one at Weshiang, the other at Nsawam. (Dr. G. E. H. Le Fanu, Medical Specialist.)

22. Appendix E.—(1) A Report on the Birthrate and Infant Mortality in the Koforidua District. (Dr. J. M. O'Brien, Senior Medical Officer.)

(2) A note on the efficacy of Prophylactic Quinine. (Dr. J. M. O'Brien, Senior Medical Officer.)

23. Appendix F.—A method of excreta disposal in the tropics which entirely prevents fly dissemination. (Major A. L. Otway, M.B.,D.P.H., R.A.M.C., (Seconded) Medical Officer of Health, Sekondi.)

G. HUNGERFORD,

Acting Director, Medical and Sanitary Services.

13TH JULY, 1925.

3. Housing.

Station.	1922.				1923-24.				1924-25.			
	Houses.		Huts.		Houses.		Huts.		Houses.		Huts.	
	Europeans.	Natives.	Europeans.	Natives.	Europeans.	Natives.	Europeans.	Natives.	Europeans.	Natives.	Europeans.	Natives.
Accra ..	162	3,101	—	—	230	3,087	—	—	240	3,365	See houses.	
Cape Coast ..	30	1,201	—	302	30	1,481	—	—	30	1,374	—	400
Sekondi ..	173	1,568	—	—	140	1,545	—	—	140	1,255	—	—
Kumasi ..	81	1,553	—	71	131	1,635	—	—	154	1,482	—	98

4. Erection of New Buildings.

Station.	1922.			1923-24.			1924-25.		
	No. of houses built without sanction.		No. of Huts built without sanction.	No. of houses built without sanction.		No. of Huts built without sanction.	No. of houses built without sanction.		No. of Huts built without sanction.
	Europeans.	Natives.		Europeans.	Natives.		Europeans.	Natives.	
Accra ..	..	157	—	—	—	149	—	—	50
Cape Coast ..	..	—	—	—	—	—	—	—	—
Sekondi ..	..	—	—	—	—	—	85	—	—
Kumasi ..	..	—	—	—	—	—	—	—	—

4. (b) Action Taken.

Station.	1922-1923.		1923-1924.		1924-1925.	
	No. of Prosecutions.		No. of Prosecutions.		No. of Prosecutions.	
	Huts.	Houses.	Huts.	Houses.	Huts.	Houses.
Accra ..	—	—	—	—	—	—
Cape Coast ..	—	—	—	—	—	—
Sekondi ..	—	—	—	—	—	—
Kumasi ..	—	—	—	—	—	—

5. Latrines.

Station.	1922.				1923-1924.				1924-1925.			
	Number.		New ones.		Number.		New ones.		Number.		New ones.	
	Male.		Female.		Male.		Female.		Male.		Female.	
	No.	Seats.	No.	Seats.	No.	Seats.	No.	Seats.	No.	Seats.	No.	Seats.
Accra ..	48	535	40	291	2	26	2	16	54	567	46	323
Cape Coast ..	9	113	9	130	—	—	—	—	16	114	16	126
Sekondi ..	20	115	20	81	1	8	—	—	19	125	11	74
Kumasi ..	34	255	34	223	—	—	—	8	42	409	46	499
									7	70	13	130

5. (b) Latrines (Private).

Station.	1922-23.								1923-24.								1924-25.							
	No.	Pails removed daily.	No. of clean pails substituted for dirty ones.	No. of night soil men.	Cesspools.	Cesspool cleansed.	New cesspools.	Cesspools abolished.	No.	Pails removed daily.	No. of clean pails substituted for dirty ones.	No. of night soil men.	Cesspools.	Cesspools cleansed.	New Cesspools.	Cesspools abolished.	No.	Pails removed daily.	No. of clean pails substituted for dirty ones.	No. of night soil men.	Cesspools.	Cesspools cleansed.	New Cesspools.	Cesspools abolished.
Accra ..	563	695	695	92	—	—	—	—	584	698	—	92	—	—	—	—	840	840	840	129	—	—	—	—
Cape Coast	134	730	—	30	—	—	—	—	134	730	—	34	—	—	—	—	118	734	—	25	—	—	—	—
Sekondi	3 8	357	384	50	—	—	—	—	321	360	575	64	—	—	—	—	375	375	—	50	—	—	—	—
Kumasi	240	489	478	67	—	—	—	—	206	425	478	67	—	—	—	—	271	492	914	96	—	—	—	—

6. Removal of Refuse.

Station.	1922-23.						1923-24.						1924-25.					
	Dustbins.	Carts removing street refuse.	Amount of refuse removed daily from street.	Carts removing refuse from yards and premises.	Amount of refuse from yards and premises.	Men employed.	Dustbins.	Carts removing street refuse.	Amount of refuse removed daily from Street.	Carts removing refuse from yards and premises.	Amount of refuse from yards and premises.	Men employed.	Dustbins.	Carts removing Street refuse.	Amount of refuse removed daily from Street.	Carts removing refuse from yards and premises.	Amount of refuse from yards and premises.	Men employed.
Accra ..	38	11	130	4	—	56	39	7	105	4	44	62	42	6 lorries.	60 lorry loads.	3	35 cart-loads.	50
Cape Coast	38	10	56	1	1 cart-load.	34	35	10	57	1 cart-load.	2 Cart-loads.	23	35	1 & 2 lorries	62 cart-loads.	—	2 cart-loads.	14
Sekondi	—	2 lorries.	25 cart-loads.	—	—	24	23	3 lorry loads.	25 lorry-loads.	—	—	51	23	3 lorries.	95 head-loads.	—	300 loads.	39
Kumasi	21 Incinerators.	1	176 loads.	2	43 head loads	2	23 Incinerators.	1	218 Baskets.	2 Baskets.	43 Baskets.	2	13 & 35 Incinerators.	1	122 head-loads & cart-loads.	4	125 head-loads.	12

7. Mode of Disposal of Excreta, Refuse and Offal.

Station.	1921.												1922-1923.												1923-1924.											
	Buried or trenched.			Burnt.			Thrown into sea.			Otherwise dealt with.			Buried or trenched.			Burnt.			Thrown into Sea.			Otherwise dealt with.			Buried or trenched.			Burnt.			Thrown into Sea.			Otherwise dealt with.		
	Pails Excreta per day.	Cartloads refuse per day.	Cartloads offal per day.	Pails Excreta per day.	Cartloads refuse per day.	Cartloads offal per day.	Pails Excreta per day.	Cartloads refuse per day.	Cartloads offal per day.	Pails Excreta per day.	Cartloads refuse per day.	Cartloads offal per day.	Pails Excreta per day.	Cartloads refuse per day.	Cartloads offal per day.	Pails Excreta per day.	Cartloads refuse per day.	Cartloads offal per day.	Pails Excreta per day.	Cartloads refuse per day.	Cartloads offal per day.	Pails Excreta per day.	Cartloads refuse per day.	Cartloads offal per day.	Pails Excreta per day.	Cartloads refuse per day.	Cartloads offal per day.	Pails Excreta per day.	Cartloads refuse per day.	Cartloads offal per day.	Pails Excreta per day.	Cartloads refuse per day.	Cartloads offal per day.			
Accra ..	—	—	—	—	—	—	695	130	24	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
Cape Coast ..	—	1	1½	—	—	55	730	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
Sekondi ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
Kumasi ..	489	166	12	—	—	199	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		

8. Average Daily Number of Cartloads of Cans, Bottles, and Incombustible Materials found from houses and Compounds.

Station.		1922-1923.				1923-1924.				1924-1925.			
Accra ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cape Coast ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Sekondi ..	..	..	..	..	..	..	..	..	..	..	..	..	..
Kumasi ..	..	..	..	..	..	..	..	..	..	..	..	..	..

33
1 cart-load
29
166

44
2 cart-loads
126 head-loads
403 head-loads

35 cart-loads
2 cart-loads
12 head-loads
6 lorry-loads

Water Supply.

1922-1923.																	
Station.	Pipe-Borne Water.			Wells.		Tanks.											
				Public.			Private.			Public.			Private.			Nature of Tank.	
	Source.	Public Stand Pipe.	Private Stand Pipe.	No.	Mosquito proof.	No.	Mosquito proof.	Above ground.	Mosquito proof.	Above ground.	Mosquito proof.	Above ground.	Wood.	Iron.	Concrete.	No.	Mosquito proof.
Accra	69	755	River-Densu	—	—	124	124	2	—	74	73	3	15	2	26	23	
Cape Coast	—	—	—	10	6	212	202	7	2	211	211	14	115	82	393	359	
Sekondi	36	110	Anan-kwan	—	—	4	4	—	—	117	113	1	139	36	36	36	
Kumasi	—	—	—	16	3	162	115	—	—	64	62	3	58	3	255	132	
1923-1924.																	
Accra	70	1,022	River-Densu	—	—	114	84	1	—	230	206	5	103	122	20	14	
Cape Coast	—	—	—	10	4	232	232	7	2	227	227	10	123	76	353	353	
Sekondi	38	131	Anan-kwan	—	—	—	—	—	—	82	82	—	62	20	—	—	
Kumasi	—	—	—	16	3	110	110	3	—	79	79	3	73	3	257	257	
1924-1925.																	
Accra	75	1,114	River-Densu	—	—	65	60	—	—	149	141	2	47	100	16	12	
Cape Coast	—	—	—	10	5	191	189	7	2	225	225	12	123	90	426	396	
Sekondi	67	143	Anan-kwan	2	2	—	—	—	—	15	25	—	15	10	—	—	
Kumasi	—	—	—	13	4	78	78	—	—	122	122	—	118	4	234	234	

Station.	Masonry Drains.										Earth Drains.			
	1922-23.					1923-24.					1924-25.			
	Lineal yards.	Lineal yards reconstructed.	Lineal yards repaired.	Lineal yard constructed.	Lineal yards.	Lineal yards reconstructed.	Lineal yards repaired.	Lineal yards constructed.	Lineal yards.	Lineal yards cleaned.	Lineal yards dug.	Lineal yards cleaned.	Lineal yards dug.	Frequency of cleaning.
Accra ..	50,312	—	—	5,337	54,644	—	—	4,332	63,213	48,357	24,724	21,183	22,507	Fortnightly.
Cape Coast ..	24,516	336	10	2,400	25,468	230	2,069	952	26,420	2,112	230	3,335	796	Monthly. Six times.
Sekondi ..	—	55	530	85	28,383	—	—	841	28,383	9,952	1,457	14,992	1,139	Monthly. When necessary.
Kumasi ..	11,702	—	—	1,540	13,394	1,692	—	1,692	3,276	8,580	850	4,885	656	When necessary.

II. INSPECTION AND PROSECUTIONS.

Station.	1922-23.										1923-24.										1924-25.									
	Inspectors employed.	Houses inspected.	Houses where larvae were found.	Notices against larvae.	Persons fined for larvae.	Notices re insanitary condition.	Persons fined for insanitary conditions.	No. of Soda and Aerated Factories inspected.	Inspectors employed.	Houses inspected.	Houses where larvae were found.	Notices against larvae.	Persons fined for larvae.	Notices re insanitary conditions.	Persons fined for insanitary conditions.	No. of Soda and Aerated Factories inspected.	Inspectors employed.	Houses inspected.	Houses where larvae were found.	Notices against larvae.	Persons fined for larvae.	Notices re insanitary conditions.	Persons fined for insanitary conditions.	No. of Soda and Aerated Factories inspected.						
Accra ..	22	146,286	1,100	128	1,039	1,484	7	4	22	156,674	937	526	740	3,412	10	3	26	165,450	1,107	505	735	4,630	1,360	3						
Cape Coast ..	12	22,293	172	366	131	101	96	—	12	24,841	348	616	312	30	83	—	12	59,569	287	424	251	114	66	—						
Sekondi ..	11	70,422	133	72	109	353	28	1	13	71,654	147	78	110	948	202	1	14	72,368	138	5	70	935	255	1						
Kumasi ..	7	34,083	639	39	565	316	1,114	1	7	37,208	751	61	607	398	886	1	17	50,778	483	62	469	1,315	4,331	1						

TABLE V.

RETURN OF DISEASES AND DEATHS (IN AND OUT-PATIENTS) FOR THE YEAR, 1924-25.

Disease.	*Remaining in Hospital at end of 1923-24.	YEARLY TOTAL.		Total Cases Treated.	Remaining in Hospital at end of 1924-25.	Remarks.
		New Cases.	Deaths.			
INFECTIVE DISEASES.						
Beri-Beri	—	41	6	41	2	
Cerebro-Spinal Fever	—	1	1	1	—	
Chicken-Pox	—	211	—	211	—	
Cholera	—	—	—	—	—	
Dengue	—	6	—	6	—	
Diphtheria	—	—	—	—	—	
Dysentery—Amoebic	4	307	11	311	2	
Bacillary	—	211	6	211	2	
Unclassified*	—	171	5	171	3	
Endocarditis—infective	—	—	—	—	—	
Enteric	4	27	6	31	—	
Erysipelas	—	6	2	6	—	†Includes cases in Venereal Clinic.
†Gonorrhoea	3	2,461	4	2,464	3	
Influenza	—	246	2	246	1	
Kala Azar	—	—	—	—	—	
Leprosy (a) Nodular	—	65	1	65	1	
(b) Anæsthetic	—	31	—	31	—	
Malaria (a) Tertian benign	—	1,218	2	1,218	—	
(b) Quartan	—	276	—	276	—	
(c) Subtertian	4	1,423	7	1,427	5	
(d) Chronic Malaria	1	1,107	4	1,108	5	
(e) Blackwater	—	16	2	16	—	
(f) Unclassified Fever	5	1,166	6	1,171	1	
Measles	—	22	—	22	—	
Malta Fever	—	—	—	—	—	
Plague	20	322	272	342	1	
Pneumonia	11	503	62	514	3	
Rabies	—	—	—	—	—	
Relapsing Fever	81	44	2	125	—	
Rheumatic Fever	1	9	—	10	—	†Only refers to cases treated in recognized Hospitals.
Septicaemia	—	31	5	31	—	
Trypanosomiasis (Sleeping Sickness)	1	25	—	26	1	
†Small-Pox	—	19	—	19	—	†Includes cases in Venereal Clinic.
†Syphilis (a) Primary	9	789	—	798	7	
(b) Secondary	5	1,368	10	1,373	6	
(c) Inherited	—	134	—	134	1	
Tetanus	2	22	9	24	1	
Tuberculosis	22	392	51	414	16	
Whooping Cough	—	35	—	35	—	
Yaws	7	6,119	1	6,126	5	†Includes one doubtful case.
†Yellow Fever	—	10	7	10	—	
Other Diseases	..	737	2	737	—	
INTOXICATIONS.						
Alcoholism	—	28	1	28	—	
Morphinism	—	—	—	—	—	
Other forms	—	1	—	1	—	
GENERAL DISEASES.						
Anæmia	—	515	—	515	—	
Anæmia—Pernicious	—	4	—	4	—	
Diabetes	—	6	3	6	—	
Exophthalmic Goitre	—	4	—	4	—	
Gout	—	8	—	8	—	
Leucocythæmia	—	—	—	—	—	
Hodgkin's Disease	—	2	—	2	—	
Myxoedema	—	1	—	1	—	
Purpura	—	2	—	2	—	
Rickets	—	25	—	25	1	
Scurvy	—	—	—	—	—	
Rheumatism	7	236	—	243	1	
Other Diseases	—	1,239	3	1,239	—	
DISEASES OF THE NERVOUS SYSTEM						
Neuritis	—	85	1	85	3	
Meningitis	—	49	12	49	—	
Nyelitis	—	8	2	8	—	
Carried forward	—	—	—	—	—	

RETURN OF DISEASES AND DEATHS (IN AND OUT-PATIENTS) FOR THE YEAR, 1924-25.

Diseases.	Remaining in Hospital at end of 1922-1923.	YEARLY TOTAL.		Total Cases Treated.	Remaining in Hospital at end of 1923-1924.	Remarks.
		New Cases.	Deaths.			
Brought forward	—	—	—	—	—	
Hydrocephalus	—	3	—	3	—	
Encephalitis	—	—	—	—	—	
Abscess of Brain	—	1	1	1	—	
Congestion of Brain	—	13	—	13	—	
Other Diseases	7	91	5	98	—	
Apoplexy	—	13	3	13	1	
Paralysis	5	79	5	84	6	
Chorea	—	11	—	11	—	
Epilepsy	—	96	1	96	2	
Neuralgia	—	237	—	237	1	
Hysteria	—	36	—	36	—	
Other Diseases	2	13	—	15	—	
Idiocy	—	14	—	14	—	
Mania	—	102	2	102	—	
Melancholia	—	19	—	19	—	
Dementia	1	16	—	17	—	
Delusional Insanity	—	43	—	43	—	
Other Diseases	4	38	1	42	2	
Diseases of the Eye—						
Conjunctivitis	5	1,828	—	1,833	4	
Keratitis	—	95	—	95	—	
Ulceration of Cornea	2	99	—	101	2	
Iritis	—	75	—	75	—	
Optic Neuritis	—	9	—	9	—	
Cataract	—	48	—	48	1	
Other Diseases	4	349	—	353	1	
Diseases of the Ear—						
Inflammation	—	720	—	720	4	
Other Diseases	—	336	—	336	—	
Diseases of the Nose	1	664	—	665	—	
Diseases of the Circulatory System—						
Pericarditis	—	21	1	21	—	
Endocarditis	—	32	3	32	—	
Valvular Mitral	—	82	3	82	—	
„ Aortic	2	23	2	25	—	
„ Tricuspid	—	—	—	—	—	
„ Pulmonary	—	4	—	4	—	
„ Unclassified	—	2	—	2	—	
Arterial Sclerosis	—	4	—	4	—	
Aneurism	—	16	1	16	—	
Other Diseases	5	163	20	168	6	
Diseases of the Respiratory System—						
Laryngitis	—	133	1	133	1	
Bronchitis	7	3,990	10	3,997	9	
Broncho-pneumonia	—	158	12	158	—	
Abscess of Lung	—	16	—	16	—	
Gangrene of Lung	—	1	—	1	—	
Emphysema	—	4	—	4	—	
Pleurisy	—	86	1	86	2	
Empyema	—	16	3	16	1	
Other Diseases	—	524	24	524	—	
Diseases of the Digestive System—						
Stomatitis	—	334	1	334	—	
Caries of teeth	—	1,015	—	1,015	—	
Glossitis	2	127	1	129	—	
Sore Throat	—	307	—	307	—	
Inflammation of Tonsils	—	264	1	264	—	
Gastritis	—	463	1	463	—	
Ulceration of Stomach	—	6	—	6	—	
Hæmatemesis	—	27	—	27	—	
Dilatation of Stomach	—	19	—	19	—	
Carried forward	—	—	—	—	—	

RETURN OF DISEASES AND DEATHS (IN AND OUT-PATIENTS) FOR THE YEAR, 1924-25.

Diseases.	Remaining in Hospital at end of 1922-1923.	YEARLY TOTAL.		Total Cases Treated.	Remaining n Hospital at end of 1923-1924.	Remarks.
		New Cases.	Deaths			
Brought forward						
Stricture of Stomach	—	11	—	11	—	
Dyspepsia	3	893	—	896	1	
Enteritis	3	566	13	569	1	
Appendicitis	3	68	—	71	—	
Colitis	1	116	—	117	—	
Ulceration of Intestines	—	6	—	6	—	
Sprue	—	—	—	—	—	
Hernia	6	282	4	288	10	
Diarrhoea	—	1,074	7	1,074	4	
Constipation	1	5,309	—	5,310	—	
Colic	—	627	—	627	—	
Hæmorrhoids	—	146	—	146	—	
Pancreatitis	—	—	—	—	—	
Hepatitis—Acute	1	131	—	132	—	
Abscess of Liver	2	94	6	96	2	
Cirrhosis	—	22	4	22	2	
Jaundice	1	81	1	82	2	
Peritonitis	—	26	8	26	—	
Ascites	1	37	2	38	1	
Other Diseases	2	332	10	334	11	
Diseases of the Lymphatic System—						
Splenitis	—	59	—	59	1	
Inflammation of Lymphatic Gland	4	173	—	177	5	
Suppuration of Lymppatic Gland	—	165	—	165	1	
Lymphangitis	—	49	—	49	—	
Elephantiasis	4	48	—	52	—	
Other Diseases	—	18	1	18	—	
Diseases of the Urinary System—						
Acute Nephritis	3	196	18	199	1	
Bright's Disease	—	26	6	26	—	
Pyelitis	—	1	—	1	—	
Calculus	—	1	—	1	—	
Renal Colic	—	24	—	24	—	
Cystitis	1	208	—	209	1	
Vesical Calculus	—	4	—	4	—	
Suppression	—	34	1	34	—	
Hæmaturia	—	44	—	44	1	
Chyluria	—	40	—	40	—	
Other Diseases	—	19	1	19	4	
Diseases of the Generative System—						
Male Organs :—						
Urethritis	—	163	—	163	—	
Gleet	—	64	—	64	—	
Stricture	3	197	3	200	6	
Prostatitis	—	30	—	30	—	
Soft chancre	—	432	—	432	6	
Condyloma	—	5	—	5	1	
Inflammation of Scrotum	1	16	—	17	—	
Dydrocele	3	111	—	114	7	
Orchitis	—	186	—	186	5	
Epididymitis	1	72	—	73	—	
Abscess of Testicle	—	61	—	61	—	
Other Diseases	—	310	3	310	10	
Female Organs :—						
Ovaritis	—	38	—	38	—	
Ovarian Cyst	—	32	—	32	—	
Endometritis	2	176	—	178	—	
Displacement of Uterus	1	45	—	46	—	
Vaginitis	1	71	1	72	—	
Amenorrhoea	—	70	—	70	—	
Dysmenorrhoea	—	106	—	106	—	
Menorrhagia	—	53	—	53	—	
Leucorrhoea	—	59	—	59	—	
Abortion	—	47	—	47	1	
Carried forward	—	—	—	—	—	

(Includes cases
in Venereal
Clinic.

RETURN OF DISEASES AND DEATHS (IN AND OUT-PATIENTS) FOR THE YEAR, 1924-25.

Diseases.	Remaining in Hospital at end of 1922-1923.	YEARLY TOTAL.		Total Cases Treated.	Remaining in Hospital at end of 1923-1924.	Remarks.
		New Cases.	Deaths.			
Brought forward	—	—	—	—	—	
Delayed Labour	1	36	7	37	—	
Post partum Hæmorrhage	—	4	—	4	—	
Retained Placenta	—	17	1	17	—	
Premature Birth	—	2	—	2	—	
Puerperal Septicaemia	—	18	3	18	—	
Mastitis	—	39	—	39	—	
Abscess of Breast	—	38	—	38	—	
Other Diseases	1	202	2	203	3	
Diseases of Organs of Locomotion—						
Osteitis	1	143	1	144	3	
Arthritis	5	533	2	538	3	
Spondylitis	—	8	—	8	—	
Bursitis	—	18	—	18	1	
Other Diseases	7	1,350	17	1,357	21	
Diseases of Connective Tissue—						
Cellulitis	6	690	4	696	9	
Abscess	7	1,108	10	1,115	7	
Elephantiasis	—	24	—	24	2	
Other Diseases	2	2,009	1	2,011	1	
Diseases of the Skin—						
Urticaria	—	124	—	124	1	
Eczema	2	309	—	311	—	
Boil	1	646	—	647	2	
Carbuncle	—	27	—	27	—	
Herpes	—	87	—	87	—	
Psoriasis	—	63	—	63	—	
Oriental Sore	—	3	—	3	—	
Tinea	—	859	—	859	—	
Scabies	—	504	—	504	—	
Acne	—	51	—	51	—	
Prickly Heat	—	22	—	22	—	
Ulcers	110	11,574	10	11,684	95	
Other Diseases	—	68	—	68	—	
Injuries (General)	25	2,032	—	2,057	21	
Injuries (Local)	40	7,436	30	7,476	75	
Surgical Operations—						
Major	2	640	3	642	—	{ Not included in totals.
Minor	1	1,027	—	1,028	—	
Tumours	5	189	5	194	9	
Malformations	—	—	—	—	—	
Poisons	—	99	—	99	—	
Parasites Animal—						
Protozoa	—	2	—	2	—	
Trematoda (Flukes)	3	16	—	19	5	
Others	—	133	—	133	—	
Cestoda—						
Taenia Solium	1	497	—	498	—	
Taenia Saginata	—	478	—	478	—	
Others	—	2	—	2	—	
Nematoda—						
Ascaris	—	302	—	302	—	
Tricocephalus Dispar	—	—	—	—	—	
Trichina	—	13	—	13	—	
Dracunculus	12	1,829	1	1,841	11	
Filariasis	—	24	—	24	—	
Strongylus	—	2	—	2	—	
Ankylostomiasis	8	208	3	216	—	
Oxyuris	—	17	—	17	—	
Others	—	41	—	41	—	
Insecta—						
Myiasis	—	6	—	6	—	
Others	—	112	—	112	—	
Totals	519	81,957	797	82,476	467	

APPENDIX A.

ANNUAL REPORT OF THE MEDICAL RESEARCH INSTITUTE, ACCRA.
FROM APRIL 1ST, 1924 TO MARCH 31ST, 1925.

Staff.—The European Staff consists of four. The Director—One Pathologist—Laboratory Superintendent and Laboratory Assistant.

Dr. Ingram had proceeded on leave in February, 1924. He retired in September, 1924.

Dr. W. A. Young was appointed Director, September, 1924. He went on leave 21st June, 1924 and returned 26th November, 1924. He was absent on Tsetse investigation, Ashanti, 2nd December, 1924 to 29th December, 1924.

Dr. A. S. Burgess became the senior Pathologist, September, 1924. He was absent on Plague duty Kumasi from 12th May, 1924–17th May, 1924. He acted as Director from 21st June, 1924 to 26th November, 1924. He went on leave January 17th, 1925.

Mr. Leeson—Laboratory Superintendent went on leave on the 6th December, 1924 and is due to return in May.

He assisted Sir William James Simpson in his investigation of the mines being absent from 19th July, 1924 to 10th September, 1924.

Mr. Abbott—Laboratory Assistant has been on duty throughout the year but was absent from Accra being in Sekondi and Kumasi on Plague work from 16th March, 1924 to 31st May, 1924 and 23rd June, 1924–30th October, 1924.

A Medical Entomologist is much needed. The 1925–26 Estimates allow for one so it is hoped the vacancy will be quickly filled. It is impossible to do Medical and Entomological work at the same time especially if one is not a trained entomologist since, if not trained, it means much waste of time in making a diagnosis and then no surety that the diagnosis is correct. But a medical man and an entomologist should produce good team work.

The 1925–26 estimates also allow for the following increases.

1. One Pathologist for Accra. At present if the Director of Medical Research Institute or Senior Pathologist are on leave then no bush investigations can be undertaken since one medical man must be at the Institute mainly for Police work but also for correspondence, etc. So this new post requires urgent filling.

2. One Pathologist for Sekondi. Sir William James Simpson recommended strongly that the Sekondi Laboratory should be opened again. This scarcely needs any emphasising when the importance of Sekondi and Takoradi are considered and that Sekondi is the terminus of the Kumasi and Huni Valley railways and may soon be that of the Western railway to Ashanti.

3. An Assistant Pathologist for relief work.

4. A new Mobile Laboratory is to be equipped.

This should prove of great value, but unless the new posts are filled cannot be used.

Native Staff.—has consisted of Mr. Paittoo—Laboratory Attendant—Mr. Bannerman—Laboratory Attendant—Mr. Marbell—2nd Division Clerk, and four labourers, and a messenger.

Except for casual leave these officers have been on duty throughout the year.

Although each attendant is supposed to have a good general knowledge of Laboratory Routine, each also specialises in one or more branches, and thus his work is satisfactory.

Each Labourer has his own particular duty. Thus there is no friction.

The Laboratory.—Work was commenced in the New Laboratory on 14th May, 1924. The Laboratory was fully described in last year's report. For facility in the working of the place, comfort and coolness, the laboratory has behaved according to expectations. Electricity is now supplied by the Town, and is alternating current. The Acetylene Plant is working well and is fairly economical.

The situation of the New Laboratory, being next to that of the Gold Coast Hospital, has allowed of much more clinical work being done.

The relations between the two institutions are very cordial and the Laboratory is greatly indebted to Dr. A. J. R. O'Brien, Surgical Specialist for the facilities allowed us in the hospital.

Dr. O'Brien kindly put at our disposal twelve beds. From a working point of view it comes to this that any case which is not surgical, and is a medical case which is either unusual or require investigation from a tropical medicine point of view, is handed over to us. Dr. O'Brien or Dr. Paterson however carry out any treatment we suggest or from our results the treatment they suggest.

The working arrangement is of great value to the patients and to all the officers concerned as a mutual gain in knowledge.

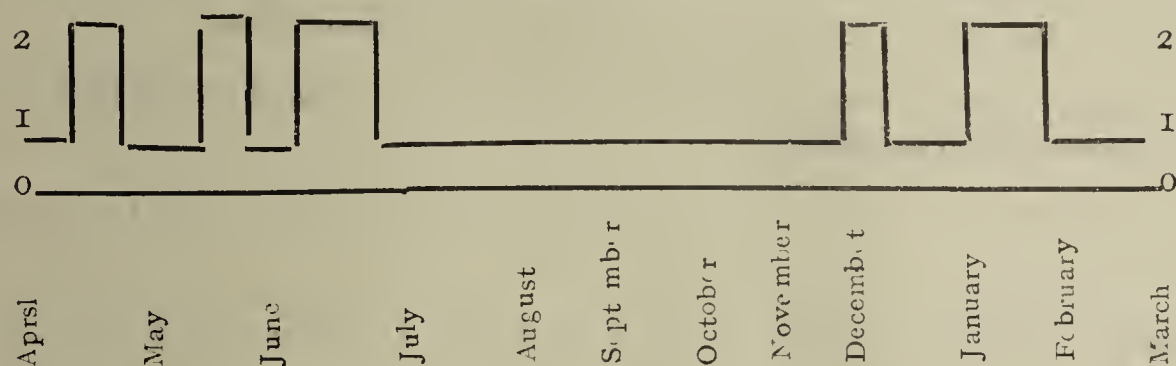
We are also grateful to Dr. C. V. LeFanu who acted for Dr. O'Brien when on leave.

To Dr. G. E. H. LeFanu we are also indebted for facilities in dealing with Yellow Fever patients at the European Hospital.

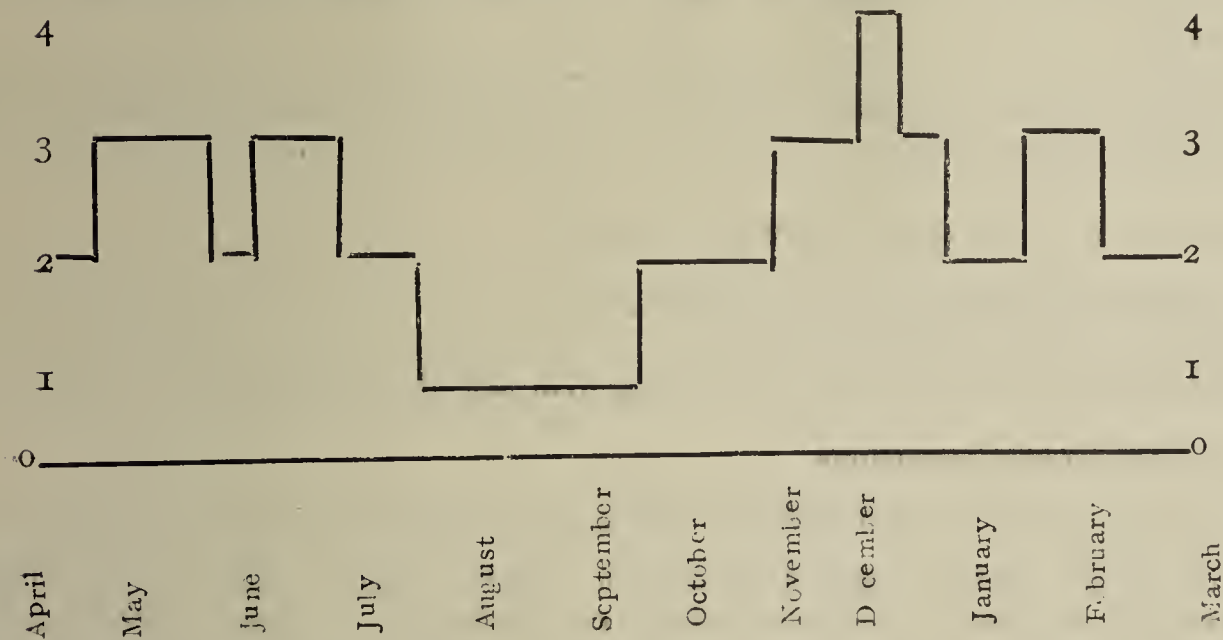
The accompanying charts show clearly the state of the European staff throughout the year.

It will be noticed that practically only one Medical Officer is present at the Institute throughout the year.

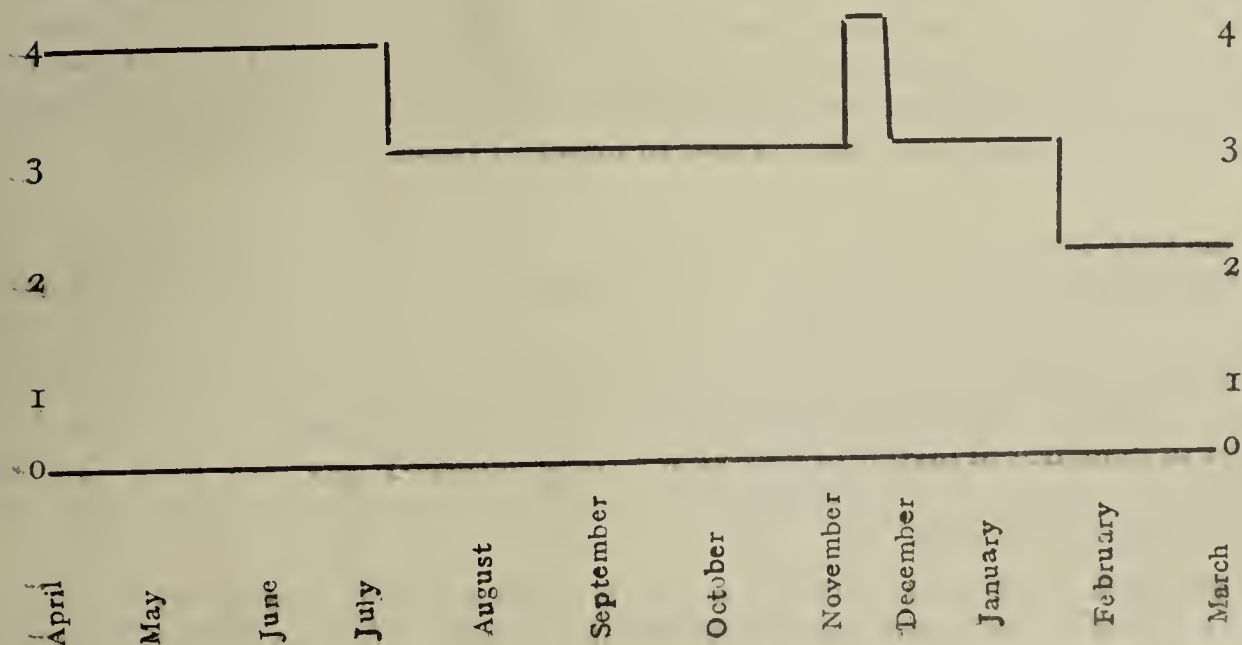
Medical Staff of the Institute on Duty at Accra.



European Staff on Duty in Accra throughout the Year.



European Staff on Duty in the Colony throughout the Year.



Blackwater Fever.—During the past year we have made various examinations in connection with this pernicious form of Subtertian Malaria.

One case—a European who unfortunately died—was of great clinical and histological interest.

Clinical history was the usual type. In all things except quinine he was moderate and a keen worker. But quinine he had no use for. His medical history was one of repeated attacks of malaria over a number of years.

Before admission to hospital he had had several days' fever culminating in a real sharp attack which ended in hæmoglobinuric symptoms. The hæmoglobinuria cleared up in three days but he had a few subtertian parasites in his blood and persistent vomiting. Quinine removed the parasites but not the vomiting. Finally he developed persistent hiccough and died 16 days after the last blackwater.

In the Post-mortem record the following notes are found amongst others.

Liver.—Very enlarged—extending downwards to umbilicus, deep yellow brown in colour weight 7 lbs.—fatty looking, gall bladder contained inspissated bile.

Histologically there is fatty and granular degeneration of the liver cells—dilatation of the bile ducts—hæmosiderin deposited.

Kidney.—Markedly enlarged—left slightly larger than right—weight respecting $10\frac{1}{2}$ and 10 ounces.

Congested—stellate veins very noticeable—cortex thinned—cut surface shows dilated vessels and fatty appearance—capsule strips easily.

Microscopically:—Intense dilatation of vessels—fibrous tissue increased considerably of cells lining convoluted tubules some were fatty—some granular and others quite disintegrated.

Straight tubules completely blocked in many places by broken down cell linings. No signs of hæmoglobin block.

Picture is that of a parenchymatous nephritis.

No malaria parasites found post-mortem.

These findings are absolutely in keeping with the Clinical history.

Both are chronic conditions.

I think it would be impossible for a kidney to develop as this one had done in 19 days.

If one could examine tissue from chronic malarial patients more often I think it would be shown that histologically chronic malaria causes distinct changes, especially in the kidney.

Repeated attacks of malaria, like all other diseases which are chronic, causes cirrhotic changes which in their turn must cause a certain amount of injury to the tubules.

On top of such a condition comes a sudden intense out-burst of malarial toxin. This toxin attacks the already injured cells of kidney and liver and although the malaria be cured the damage to the kidney and liver cells is beyond repair, at least in the kidney, and the man dies actually of a nephritis which is due to malarial toxin initially, though other body toxins due to disordered function may help.

This case is quoted merely to add another to the long list which goes to show that Blackwater Fever is merely the natural culmination of a chronic malarial history.

As long ago as 1899 W. H. Crosse—consulting medical officer to the Royal Niger Company in summing up the evidence in favour of Blackwater Fever being a complication owing to the course of Malaria and not a distinct disease, writes "I venture to think there is a large amount of evidence in favour of this view. It is certainly the view held by most African Practitioners." Surgeon G. McGregor 1899 writes in the "*Guy's Hospital Gazette*, January 21, 1899."

Dr. Moffat, Principal Medical Officer, Uganda had the courage to treat his cases with heroic doses of quinine and six recovered out of seven. *British Medical Journal* September 24th, 1898.

Dr. Robson—British Medical Journal October 22nd, 1898 writes as follows :—

“Again, in the most severe cases of Blackwater Fever I have seen patients get well “who have been heroically treated with quinine—when the tropical physician has a “better remedy supplied him, no doubt he will relinquish his old favourite, but *assuredly* “not till then.”

And many more authorities could be quoted.

Twenty-six years have elapsed since Crosse wrote, and every thing in West Africa in my opinion has gone to show that :—

1. Those who do not get malaria never get Blackwater Fever.
2. Those who take prophylactic quinine in correct amounts, according to varying conditions or briefly who take quinine scientifically neither get malaria nor Blackwater Fever.
3. The best treatment for Blackwater Fever is the judicious use of quinine.
4. If the blood is examined before the attack, malarial parasites of the subtertian variety are always found, and can usually be found sometime during the attack. It can scarcely be wondered at that parasites are difficult to find during the attack since Blackwater Fever is nature's method of destroying the parasite.

It would occupy too much space to mention all those who are agreed the subtertian parasite is the cause of Blackwater Fever. I am of opinion that the majority of the West African Medical Staff certainly do. Stephens has always maintained this view. Manson also came finally to the same conclusion and to-day there is Thompson's (London Tropical School) ably written report on Rhodesian Blackwater Fever where he proves completely the malarial origin of Blackwater Fever.

Allowing that all is not completely known about the etiology of that pernicious form of chronic subtertian malaria which results in so-called Blackwater Fever the evidence to-day appears to me to be overwhelmingly in favour of malaria as the cause and that quinine both prevents and cures.

Since writing the above I have been presented by the United Fruit Company with a copy of “International Conference on Health Problems in Tropical America.” On page 134 Dr. John Gordon Thomson makes the following statement which I think is worth giving in full and with every word of which I thoroughly agree.

“THE PREVENTION OF BLACKWATER FEVER.”

“I have no intention of dealing fully with this subject in the present short paper, but in “view of the importance of this conference from a public health point of view, I should like to “state that, as hæmoglobinuric fever is undoubtedly due to repeated intense infection with “*Plasmodium falciparum*—usually over a prolonged period of several months or years—we “have at hand a disease that can be not only controlled, but absolutely abolished, by anti- “malaria measures. Malignant tertian is very responsive to quinine treatment, much more “so than benign, so it is certain that, if this drug were properly used in treatment and prophylaxis by this means alone in areas where other methods of malarial control were imperfect, “we could practically abolish the disease.

“Recently it has been proved that quinine taken prophylactically, by the method usually “adopted in tropical countries, is insufficient to prevent infection, but its regular use prevents “the parasite from doing the same amount of damage, and so, in my opinion, prevents black- “water fever. Quinine has fallen into disrepute because it has been improperly used. I never “saw a case of blackwater develop in a person who took regular daily doses of quinine prophylactically, even though he might develop malaria. But all the cases that I investigated in “Rhodesia (more than 150) took intermittent occasional doses quite insufficient either as a “cure or as a preventive; and when finally a dose was taken, and followed by blackwater fever, “the drug was damned. There is, throughout the Tropics, a great need for proper instruction “and effective propaganda to the laity, regarding the use of quinine.

Trypanosomiasis.—This is a brief epitome of a full report sent to the Secretary of State in January, 1925.

The work was undertaken in December, 1924 and occupied a period of 26 days from Accra to Accra.

The route was through the following larger towns.

Kumasi—Kintampo—Whala—Wenchi—Tairsu—Banda—Bwe—Gwere—Kintampo and back.

The period of the year was that of late rains and early Harmattan. The year before part of this journey was done in the dry season. There is a vast difference in the findings of the two reports.

The type of country is orchard bush—except towards and around Wenchi where forest is more prevalent and at Banda and the north side of the Volta where grass and orchard bush is encountered. The Volta—Tain and other tributaries except for occasional spots have the banks well wooded and the undergrowth is thick. At this time of year the trees forming the orchard bush still have their leaves and here and there is an occasional marsh. Two months later these trees would be leafless and the marshes dry.

The main objects were to see if the intensity of the “ fly ” varied as compared to the dry season, and to get an idea of the infection rate of the tsetse flies caught and as far as possible some idea of the human infection percentage.

The intensity of the fly seems roughly to vary with the rainfall. Of the *G. palpalis* caught 164 were males and 121 females.

The total infections were 17 made up as follows.

Gut.	Salivary.	Probosis.	Hypopharynx.	
15	—	8	7	— 6%

Of these at least seven are thus seen to be infected with the Congolense type of Trypanosomes.

Microscopic examination proved this correct.

The number of *G. longipalpis* caught was 31.—17 males—14 females.

Total infections numbered four.

Gut.	Salivary.	Probosis.	Hypopharynx.	
4	—	3	3	—13%

Again three infections showed the trypanosome to be congolense. In 17 *G. tachinoiedes* examined no infections were found.

It is difficult to estimate the human infection rate in a hurried visit. Large numbers have enlarged glands but unless examined by puncture it is impossible to say with any certainty if they are Sleeping Sickness glands.

Of 200 of the inhabitants of Kintampo (the population is probably 3,500) 15 showed enlarged glands and in 5 *T. Gambiense* was found.

Of a company of the West African Frontier Force stationed there only two had enlarged glands but they were negative.

At Sobinsu one boy showed typical glands but I failed to find trypanosomes although I think he was undoubtedly an early case of Trypanosomiasis. At Wenchi, in the Ashanti town, two cases were found. In the Zongo or strangers town of a 100 examined 13 showed typical glands but unfortunately I was unable to puncture these. I agree with Kinghorn's statement that five per cent. of Wenchi is probably infected.

At Bwe a boy of 10 and a girl of 15 showed typical glands but only the girl was positive.

At Bwe one of the carriers (a Hausa) was also found to have trypanosomes. This was found out in an unusual manner. While dissecting a palpalis which was rather full of this man's blood (he had caught it feeding on him) two trypanosomes were seen in the gut which were obviously not gut forms. The suggestion naturally arose that they were taken in with the feed of blood. The carrier was examined and was found positive. It would be interesting to know how many flies he had infected *en route*. The other carriers were found negative. Thus out of 900 people examined for glands eight positive cases were found or about one per cent. This may be high for the whole population of Ashanti but I doubt if the infection rate is less than $\frac{1}{2}\%$.

The ages of the infected people varied from 5–30, but the average age is more likely to be 12–16 if large numbers be examined.

Five species of Glossina were captured, *i.e.*, G. palpalis—longipalpis—tachinoides—fusca (four specimens) and pallicera (one specimen), the last two species being got in the Wenchi country (I wish here to thank Dr. Guy Marshall, C.M.G. for verifying and correcting the names of these specimens. I mistook a G. fusca for a G. medicorum.)

The breeding places of G. palpalis are difficult to find.

Any number of suitable places were looked at with negative results. The banks were hard composed of clay covered with leaves.

At Bwe on the Volta in a sandy patch—a typical tachinoides breeding ground 190 pupae, and a few empty cases of tachinoides were got and one pupa of palpalis. Last year in February no pupae were found in this place. The fact of there being few pupae cases suggests breeding had not long commenced and the absence of pupae two months later, together indicate a short period of three months as the breeding season of G. tachinoides.

The Food of the “fly” was always mammalian blood and when it was recognisable belonged to the human group.

No reptilian blood was seen and no T. grayi infections found.

The following paragraphs from the original report are given below as in the original.

Sleeping Sickness.

In only two of the cases did the patient show that he or she was definitely ill.

Three cases certainly seemed a little dull otherwise they appeared fit and were working. The remainder carried on as usual.

Auto-agglutination of the blood was a marked feature and was also seen in those cases having glands but not showing trypanosomes.

Such blood in thick film gives the appearance of being greasy. There can be no doubt that a careful examination of all natives would reveal quite a number of cases and possibly triple centrifuging of the blood many more.

However there can be nothing of an epidemic character. No evidence can be found to suggest epidemics. All evidence goes to indicate the chronicity of the disease and if the transverse scars of the neck are of any value in indicating native treatment for Sleeping Sickness then a large number must have had the disease and recovered. One girl had had this treatment and had just returned but she was positive.

There is no doubt that Sleeping Sickness is endemic in Ashanti.

Suggestions.

A useful piece of work might be done in connection with palpalis with headquarters at Sobinsu or Wenchi. This I intend to have done if our staff is increased. It would be very useful to know where this species breeds. Also Wenchi would make a good centre for the treatment of Sleeping Sickness in the district.

If one were to cure a few cases of yaws first, the confidence of the people would soon be won.

Both at Wenchi and Kintampo all the low bush should be cleared away at the drinking supplies. All the tall trees could be safely left. All the Medical Officers in these district should be well supplied with Bayer 205.

Conclusions.

Sleeping Sickness is by no means a rare disease in Ashanti but it is undoubtedly chronic and probably many spontaneous recoveries take place.

2. In the rains *G. palpalis* is found every where and *G. longipalpis* is more numerous on the roads.

3. In the dry season many streams dry up and *G. palpalis* leaves such areas—*G. longipalpis* evidently retires to moister grass areas.

4. It would appear that the breeding period is restricted and that there is evidence that the accidental death rate of pupae is by no means small.

5. It is a difficult thing to state if there is any increase in either trypanosomiasis or the intensity of the fly but it can be safely said that since Kinghorn made his excellent report in 1910-1911 neither the fly nor the number of cases has diminished.

Recently I read a report by the Medical Officer Wa, Dr. A. G. Mackay. There appears to be evidence of a certain amount of Sleeping Sickness in the Gongga districts—Northern Territories and when the occasion permits, these districts will be examined.

Plague.

On June 20th 1924, smear from buboes and bubonic tissues were forwarded here from Kumasi for diagnosis. There was no difficulty the smears and tissues were teeming with typical *B. pestis*.

Owing to our lack of staff (the acting D.M.R.I. went on leave shortly after and the senior Pathologist was left alone) only Mr. Abbott—Laboratory Assistant could be spared for Kumasi and he proceeded there from Sekondi. There he did good and useful work.

Major Ingolby, R.A.M.C., was appointed Plague Pathologist and took up his duties there in October, 1924. As he has been placed temporarily on the Sanitary Staff his report will come under that heading.

It may be of interest to remark again on the chronicity and comparative non-virulence of *B. Pestis* as seen in the Gold Coast rat.

In discussion with Major Ingolby on this matter he said he was doubtful of some of the organisms being true *pestis* as it was nearly impossible to kill a rat with one injection and still more difficult to get a culture of the organism.

The method of frequent inoculation of the spleen of one rat into another every 4th-6th day was found to increase the virulence very greatly so that by the end of a month a culture grown from the last rat was sufficiently virulent on injection to kill a fresh rat in 2-3 days.

This indicates a high natural immunity on the rats yet curiously enough in Sekondi—Kumasi and Accra it was only after the first human case was found that the rats showed *pestis* in numbers and the typical test book plague rat was rarely found.

This year the Accra rats have shown the presence of chronic plague but no human case has been discovered in Accra.

It seems doubtful, if the rat flea is the only vector, and if there is not direct vector communication from man to man. In any case more information is required on this point.

On the 5th March, 1925 Dr. G. Robinson the Medical Officer Cantonments brought a sputum smear in which he had observed several organisms which suggested *pestis* to his mind.

The opinion was confirmed at the Laboratory and the case seen with Dr. Robinson. The man was very distressed and his lungs were full of moist rales and crepitations and he sounded like one drowning in his own sputum. The sputum was slightly tenacious but contained few pus cells and was tinged with bright red blood. The condition was more a bronchitis than a pneumonia. A fresh slide examined showed bipolar bacilli more numerous. The next day the sputum showed more still. The day following pus cells were more numerous and the plague bacilli fewer and degenerate and the prognosis of recovery was made. He did recover—Ten c.c. of his blood was put into a rat's abdomen and the rat was killed on the 6th day—spleen and liver showed scanty but typical *B. Pestis*—The spleen was subinoculated into rat 2. This was killed seven days later and *B. pestis* recovered from the internal organs and at the site of inoculation. This soldier had not left Accra for two years but he had been inoculated with plague vaccine less than a year ago. The only source of infection seemed to be from 90 odd soldiers who had come from Kumasi about a fortnight previously. The diagnosis would appear to be mild septicæmic plague with lung symptoms.

I think it is to be doubted if genuine pneumonic plague occurs in the Gold Coast. Cases, where lung symptoms are very prominent and pestis found, are common but together with the *Bacillus* of plague the pneumococcus and other organisms are always found, and post-mortem, the lung conditions are not those as described in text books of typical pneumonic plague. Besides, one would expect a greater infection rate and a greater mortality and also an accidental European infection especially among those who are working with plague patients.

On the 9th March, 1925 a child was brought late at night to the Gold Coast Hospital the symptoms being a swollen right neck and abdominal pain.

Dr. A. J. R. O'Brien Surgical Specialist—when again seeing it in the morning became suspicious of the case and asked me to investigate it as he suspected bubonic plague.

The child about four years old—was obviously very ill, and very dull of intellect and looked very anxious.

There was a sore on the chin—an insect bite. The right side of the neck was markedly œdematous and deep pressure revealed swollen glands. Smears from the chin sore and gland punctures showed bipolar bacilli though scanty. The pulse was feeble and temperature subnormal. A few hours later death occurred and a post-mortem examination at once carried out. The main features were the bubo of the neck consisting of œdematous tissue with hæmorrhagic glands and the hæmorrhagic mesenteric glands (this accounts for the abdominal pain). From all the internal organs but especially the spleen the smears showed large numbers of typical *B. pestis*. The child had been brought the day before from Koforidua.

Diagnosis was that of Typical Bubonic Plague.

On the 12th of March a moribund woman was seen in the out-patients Department. Dr. Paterson noticed the unusual chest condition which was like that of the first case described. The sputum showed bipolar bacilli. Post-mortem examination showed bipolar bacilli in all the organs. A rat inoculated from her blood showed pestis on the 6th day when killed. Diagnosis septicæmic plague with lung symptoms. This woman came by lorry from Nsawam the day before and had recently been residing in Koforidua.

Yellow Fever.

Five cases of this disease have come under our personal observation and on each of these a post-mortem examination was made. Three of these cases were Europeans and two natives. All were diagnosed ante-mortem except one of the natives who was brought in dead.

Both from a clinical and post-mortem point of view the cases answered all that is required for the label Yellow Fever. In two cases (Europeans) where the onset was definitely known, blood was examined on the 2nd and 3rd days of the illness by the dark ground method and no leptospira seen. Guinea pigs were also inoculated on the spot with 5 c.c. of blood. At no time did they show leptospira and all recovered except one which died from pneumonia. Sections of its liver and spleen failed to show any spirochæta. The temperature charts were interesting. From the normal of 100.2°F the temperature went up to 103°F in 36 hours and fell to normal again in about 72 hours then in another three days had reached 104.6°F and gradually fell by lysis and was normal by the 15–18th days. These guinea pigs were inoculated last May and are still alive.

Guinea pigs inoculated from a native case showed the same type of chart.

The sixth case we did not see but examined histologically. The organs and the findings were not inconsistent with Yellow Fever.

Dr. Burgess was fortunate in discovering a leptospira in the tap water.

The following is his account of his findings.

LEPTOSPIRA IN ACCRA TAP WATER.

With reference to Buchanan's discovery ⁽¹⁾ of free-living leptospira pathogenic to guinea pigs it may be of interest to record the occurrence of leptospira in Accra tap water. Their occurrence in pond water is well known and their discovery in tap water is not new.

Buchanan mentions two observers who have found them in this medium and ⁽²⁾ Coles records finding them in a glass vessel which had been repeatedly filled from the main.

In Accra the leptospira were found in deposit obtained by centrifuging tap water for about half-an-hour, in scrapings from a household filter candle and in washings from the lower chamber of the filter, but only in very small numbers—about one in each fresh film. They were rather more numerous (five or six per film) in a bottle which had been filled up daily from the household filter for several weeks. They were examined living by the dark ground method, and also in films which were fixed in osmic acid vapour, then dried and stained by the Warthin—Starry method. In general shape and in the character of the spiral they closely resembled *L. icteroides* or *L. icterohæmorrhagica*. They usually consisted of a more or less straight middle portion with semi-circular hook-like ends. Sometimes instead of being hooked, the terminal portion was bent at an obtuse angle. Their length, measured between the convexity of the curved extremities, ranged from 5μ to 17μ the average being about 10μ . The wave length or pitch varied from 0.375μ to 0.62μ , the average being about 0.5μ .

They showed all grades of activity. The most active underwent a very rapid and persistent movement. A good many were seen adhering to the glass and moving backwards and forwards along it, one end usually being free and in rapid movement. In the case of resting organisms the spirals were distinct in some cases, but in others could be seen along the convexity of the terminal curves. Inoculations of animals or of culture media has not yet been attempted.

(1) B. M. J. November 29th, 1924.

(2) Coles English Mechanics, November 2nd and November 9th, 1923.

Leptospira Icterohaemorrhagiae in Rats.

During December, 1924 and January, 1925, 100 rats were examined for the above organism.

The species were	<i>Cricetomys gambianus</i>	..	88
	<i>Mus decumanus</i>	..	6
	<i>Mus rattus</i>		6

The method used was to grind the kidneys up with sterile sand, filter through ordinary filter paper and examine by dark ground illumination.

Occasionally a rat was inoculated with the kidneys of another one. All cases proved negative.

In 1917–18 Dr. Ingram examined a large number with negative results.

In 1919 Dr. Macfie reports a few rats were examined by the same method with negative results.

In December, 1920 to March, 1921, 50 rats were again examined also negative.

Last year Dr. Burgess carefully examined during March, 1924, 75 *Mus decumanus*—11 *Mus rattus* and 14 *C. gambianus* with the same results.

Leger and certain examined rats in Dakar in 1917 with negative results.

Noc however, thinks the organism exists but his report is not clear reading.

It may be remarked here that the Dark ground examination-field is a wonderful place for letting imagination run riot and that one must be very careful in the interpretation of results.

Stokes (Rockfeller Yellow Fever Commission 1920) at Lagos found all rats examined-negative.

At present therefore it may be said that there is no evidence of the existence of *Leptospira icterohaemorrhagica* in rats in demonstrable quantities.

RAT EXAMINATIONS.

Rats received from M.O.H.

	<i>C. gambianus</i>	<i>M. Rattus</i>	<i>M. decumanus</i>	Monthly Totals.
April ..	130	609	806	1,545
May ..	200	878	550	1,628
June ..	130	471	280	881
July ..	302	851	623	1,776
August ..	417	668	1,513	2,598
September	316	673	601	1,590
October ..	129	551	494	1,174
November	184	479	184	847
December	171	456	465	1,092
January ..	135	417	364	916
February	202	269	318	789
March ..	76	60	42	178
Total	2,392	6,382	6,240	15,014

Rats examined for *B. pestis*.

April ..	70	Infected	9 (8 <i>C. gambianus</i> 1 <i>M. rattus</i>)
May ..	584	„	4 (1 „ 3 „)
June ..	400	„	—
July ..	715	„	—
August ..	698	„	—
September	730	„	—
October ..	130	„	—
November	125	„	—
December	120	„	—
January ..	134	„	—
February	118	„	—
March ..	260	„	8 (7 „ 1 „)
	4,084		21

In March the flea population on the rats increased considerably.

The following fleas, found on Rats examined at the Laboratory, were examined and identified by Miss Evans of the Liverpool Tropical School. We are grateful and thank her for her kindness.

It will be noticed how great the preponderance of *X. aequisetosus* is.

This agrees with the findings, again by Miss Evans, in Macfiés report of the Laboratory work for 1922-1923.

X. aequisetosus, as far as our literature shows, has not yet been incriminated as a plague vector and this may account, as Dr Burgess suggests, for our freedom from plague in Accra recently. Be that as it may, there is no doubt, I think, that the freedom from plague in Accra was in the main due to the excellent sanitary measures instituted and carried out by Dr. Dowse M.O.H. (now in Nigeria as S.S.O.) and now carried on by Major Ahern, R.A.M.C., the present M.O.H.

<i>Mus rattus</i>	..	Slides	..	15. V. 1924	..	<i>Xenopsylla aequisetosus</i>	End.	..	3
						<i>X. cheopis</i> Roths	..	..	1
				10. x. 1924	..	<i>X. aequisetosus</i>	..	..	1
						<i>X. cheopis</i>	..	..	7
		Tube	..	11. x. 1924	..	<i>X. aequisetosus</i>	..	..	4
<i>Mus decumanus</i>	..	Slides	..	14. x. 1924	..	<i>X. aequisetosus</i>	..	..	35
<i>Cricetomys gambianus</i>		Slides	..	10. x. 1924	..	<i>X. aequisetosus</i>	..	..	16
				13. x. 1924	..	<i>X. aequisetosus</i>	..	..	16
						<i>X. aequisetosus</i>	..	..	4
						<i>X. aequisetosus</i>	..	..	15
						<i>Ct. felis</i>	..	..	3
						<i>X. aequisetosus</i>	..	..	6
				14. x. 1924	..	<i>X. aequisetosus</i>	..	..	10
				15. x. 1924	..	<i>X. aequisetosus</i>	..	..	25
				16. x. 1924	..	<i>X. aequisetosus</i>	..	..	3
						<i>X. aequisetosus</i>	..	..	20
<i>C. gambianus</i>	..	Tubes	..	6. xi. 1924	..	<i>X. aequisetosus</i>	..	..	119
						<i>X. cheopis</i>	..	..	2
						<i>Ct. felis</i>	..	..	2
				7. xi. 1924	..	<i>X. aequisetosus</i>	..	..	43
						<i>X. cheopis</i>	..	..	4
						<i>Ct. felis</i>	..	..	1
				7. xi. and xii.					
				1924	..	<i>X. aequisetosus</i>	..	..	47
				10. xi. 1924	..	<i>X. aequisetosus</i>	..	..	42
						<i>X. cheopis</i>	..	..	1
						<i>X. sp. incert. abdomen</i>			
						missing	..	..	1
						<i>Ct. felis</i>	..	..	3
				11. xi. 1924	..	<i>X. aequisetosus</i>	..	..	74
						<i>X. cheopis</i>	..	..	2
						<i>Ct. felis</i>	..	..	3
				12. xi. 1924	..	<i>X. aequisetosus</i>	..	..	42
				11. xii. 1924		<i>X. aequisetosus</i>	..	..	124
						<i>X. cheopis</i>	..	..	3
				1924		<i>X. aequisetosus</i>	..	..	6

Post-Mortem Examinations.

A total of 154 bodies were examined Post-mortem. In most cases a true cause of death was obtained but in some the real cause was difficult to ascertain because, when seen, the body was showing marked Post-mortem changes. In one or two cases, no definite cause could be assigned.

The value of Post-mortem examination cannot be too highly appreciated and there is an immense field for morbid histological research. A large amount of section cutting has been done from the material obtained from those Post-mortems but to be of value the examination must be made as soon as possible after death.

Of all the organs the liver is the most difficult to follow in its pathological changes. In fact it is seldom one finds a normal liver but whether this is due to rapid post-mortem changes or not requires further investigation.

Accidents.

Drowning	..	..	..	..	..	..	..	..	..	..	3
Gunshot wounds—various	..	..	..	..	..	..	..	..	..	..	5
Knife wounds	..	..	..	..	..	..	..	..	..	..	2
Foreign body in larynx (fish vertebra)	..	..	..	..	..	..	..	..	..	..	1

Due to Motor Cars.

Fracture of ribs—pulmonary haemorrhage	..	..	..	..	..	..	..	..	..	..	1
Rupture of liver	..	..	..	..	..	..	..	..	..	..	1
Various wounds—shock	..	..	..	..	..	..	..	..	..	..	4
Dislocated spine	..	..	..	..	..	..	..	..	..	..	1
Fracture of skull	..	..	..	..	..	..	..	..	..	..	1

Burns. (—a part from shock there was marked destruction of Liver cells and in one case acidosis and glycosuria)

acidosis and glycosuria	..	..	..	..	..	..	..	..	..	..	3
Scalds	..	..	..	..	..	..	..	..	..	..	1
Strangulation (various ways—all suicidal)	..	..	..	..	..	..	..	..	..	..	5
Poisoning by Croton oil	..	..	..	..	..	..	..	..	..	..	1
„ „ Kerosine	..	..	..	..	..	..	..	..	..	..	1
Causes not defined	..	..	..	..	..	..	..	..	..	..	5

The cases of Gumma and aneurysm of the left ventricle, and pyonephrosis due to large bladder calculus have been fully described elsewhere.

The measurements of the calculus are again given here since urinary calculi are rare on the West Coast and there seems to be no record of one so large as this.

Weight	= 4 oz 263 grams—131 grammes.
Length	= 6.3 cms. —2.45 inches.
Breadth	= 5.6 cms. —2.2 inches.
Thickness	= 4.4 „ —1.75 „
Circumference	= 18.9 „ —7.4 „
Volume	= 73.9 c.cms.

Histological Examinations.

Two hundred and forty-nine tissues were examined histologically.

They include livers 76—kidneys 53—hearts 7—spleen 20—Pancreas 7—Intestinal ulcers 7—skin ulcers 2—Plague buboes 14—Plague lung 3—Stomach 4—Lungs 20—Tonsil 1—Lymph glands 6—Thyroid 2—Bladder 1—Suprarenals 2—Mesentery 3—Pons 1—Cerebrum 5.

Tumours.—Identified were:—Soft fibroma multiple of the skin 1.—Uterine fibromyoma 1. Carcinoma of parotid 1 Spheroidal celled carcinoma of the bladder with metastasis in the liver 1. Squamous celled epithelioma of penis 1.

Epulis of jaw—doubtful structure? Carcinomatous sarcoma 1 Male breast—simple adenoma 2.

Melanotic sarcoma of heel 1—Round celled sarcoma of axilla 1—Myxo—sarcoma of arm 1.

Large round celled sarcoma of radius 1—Fibro—sarcoma radius 1 Alveolar sarcoma of palate 2.=15.

Except in the case of the tumours the above tissues with a few exceptions were post-mortem specimens and were sectioned either to confirm the diagnosis or to enable one to be made.

To differentiate certain septic conditions from Yellow Fever it is absolutely necessary to appeal to the results of section cutting. Coffee grounds—fly speck vomit and petechial hæmorrhages in the stomach wall are not by any means confined to Yellow Fever only.

Wassermann Reactions.

341 samples of serum have been tested for the above reaction. The method used is that of Colonel Harrison as described in the Medical Research Pamphlet. In testing the complement value of the guinea pig serum however we make a larger number of dilutions between the same points and thus get greater precision in there sults.

The results have been consistently clean-cut throughout the year.

The actual results were

Positive	++	=	178
Positive	+	=	46
Negative		=	117

Medical Officers at a distance from Accra are requested to send the serum only, in sterile vaccine bottles with rubber caps. As a rule the sera arrive in good condition. If not they are discarded and a fresh specimen asked for.

The tests are made the first and third Wednesdays of each month.

One case may be mentioned as of interest.

A native woman was admitted under Dr. Paterson's care in the Gold Coast Hospital.

Her chief symptom was her inability to keep awake.

She had rectal and bladder incontinence. When spoken to, she answered in a drowsy manner and promptly went to sleep again.

The skin was fairly clean.

She had glands in the posterior triangles of her neck.

She had a small scalp ulceration but all the symptoms together suggested sleeping sickness at a late stage. Gland punctures—the blood and the cerebro-spinal fluid failed to show trypanosomes. The glands were not really those of sleeping sickness however.

The Wassermann test was strongly positive.

Dr. Paterson put her on iodides first and then started with small doses of N.A.B. In a fortnight she was markedly improved—the control of her sphincters returned, (of course the loss of control may simply have been due to the sleeping condition), she could walk and laugh and eat heartily. She steadily recovered.

Blood Examinations included. Total .. 202.

For malaria :—

Europeans :—	Subtertian	..	..	13
	Tertian	..	..	1
	Negative	..	..	45
	Total	..	..	59

Natives :—	Subtertian	..	..	32
	Tertian	..	..	2
	Quartan	..	..	1
	Negative	..	..	87
	Total	..	=	122

Blood films for other protozoa = Relapsing fever 3
Negative 30

Blood counts—Complete = 3
Differential = 22

One Blood sugar estimation made.

One Blood culture made in case of septicemia.

Widal Reactions Total 20.

I	positive	A 1/25
I	"	T 1/250 A and B 1/50
I	"	B 1/50
I	"	T 1/2500 A and B 1/250
I	"	Flexner W.V. and Y.Z. 1/50

Shiga 1/250. (This serum was obtained from a patient who had been given polyvalent Dysentery serum.)

Sputum. Total 273.

Showing Tubercle Bacilli ..	61
Spirochaetes ..	26
Pneumococci ..	9
B. pestis ..	2

It is doubtful if Bronchial Spirochaetosis is a disease per se here. When these spirochaetes are present in the sputum in most cases they can also be found in the patients gums. Drawings by the camera lucida of the organisms from the sputum are in complete accord with those from the mouth.

Urines. :— Total examinations 192.

Negative	=	70
Bilharzia present ..	=	8
B. pyocyaeneus ..	=	1 (a European)

The other urines contained pus cells—casts—bladder epithelium etc. in various degrees)

Smears.

Leprosy 8 examined 3 positive.
 Gland punctures for Trypanosomes 3—1 positive.
 T. gambiense Dr. Smeath's case.
Plague 45 smears—24 showed B. pestis.
 5 cultures were also made.

Urethral and vaginal 34 examinations, 14 positive for gonococcus. Chancres—examinations 9 S. pallidum 3.

Vaccines. Staphylococcus and Pneumococcus 6.
 Organism from spleen abscess 1.

ANIMAL INOCULATIONS.

C. gambiabus for Tubercle Bacilli ..	..	1.
" with B. pyocyaeneus ..	..	1.
" fed with Salmon ..	..	4.
" for Trypanosomes ..	..	1.
" for Plague ..	..	3. Positive.
" for Bilharzia ..	..	4. Negative.
Guinea pigs for Plague ..	..	7—typical infection 1.
" " for Yellow Fever ..	..	6.
" " for Trypanosomes ..	..	1.
" " with water spirochaetes ..	..	1. Negative.

MISCELLANEOUS.

Various animal examinations other than

for B. pestis	73.
Ascitic fluid	2.
Seminal stains	2.
Empyema	1.
Liver abscesses	4.
Scrotalabscess	1. Fusiform bacilli and spirochaetes.
Spinal fluid	2.
Throat swabs	2.

FAECES EXAMINATIONS.

EXAMINATIONS FOR OVA Total = 1,008.

	<i>Hospital Patients.</i>	<i>School boys.</i>	<i>Sisal Plantation labourers.</i>
Number examined	676	255	77
Negative	325	166	55
Anklostoma duodenale	189 = 26%	51 = 20%	20 = 26%
Ascaris lumbricoides	163	32	3
Trichiuris trichiura	58	14	1
Flagellates (including Cercomonas, Chilomastix mesnili Trichomonas)	39	2	—
Strongyloides Larvae	36	4	—
Taenia saginata	8	1	1
Oxyuris vermicularis	6	1	—
Blastocystis	11	2	—

Dysentery.

55 samples of Dysenteric faeces were examined.

22 showed the presence of E.histolytica or its cysts.

Seven were negative for amoebae and the cell picture suggested a bacillary nature. Organisms were isolated which were agglutinated by the patients sera but did not conform to a typical type of Dysentery bacillus.

From one case a Monilia ? tropicals was grown. This has been recorded here before by Macfie (Annual Report Medical Research Institute, Accra, 1921, page 44). The other samples showed a cell picture more typical of Amoebic Dysentery and Emetin cleared up the symptoms. More work is required on this subject however.

WATER EXAMINATIONS.

TOTAL EXAMINATIONS 114. =

	B coli in 100 c.c.	B coli in 10 c.c.	Negative	Remarks.	No. Examined.
No. 1 Final Filter ..	—	1	8	Lactis aerogenes in 100 c.c.	10
2 „ „ ..	1	—	7	—	8
3 „ „ ..	2	—	7	—	9
4 „ „ ..	4	—	6	—	0
5 „ „ ..	1	—	6	—	7
6 „ „ ..	1	—	8	—	9
No. 1 Storage Reservoir	8	1	2	—	12
No. 2 Storage Reservoir	7	3	3	—	13
Stand pipes in Accra ..	3	1	2	—	6
Laboratory Tap	1	—	3	1 ? pyocyaenous in 100 c.c. ..	5
Soda Water, Accra ..	5	—	8	—	13
Kumasi	2	—	9	1 well showed B coli in 101 c.c.	12

It need scarcely be remarked that in all cases controls were also put up.

Schistosomiasis.—This subject is still under consideration but so far results are negative.

Four rats (C.gambianus) were immersed for one hour in the actual pool where the snails (Physepsis globosa) are got and in which the human miracidium reaches the cercarial stage but no infection of the rats was obtained.

Unfortunately this pool is 14 miles outside Accra.

SIR WILLIAM SIMPSON'S VISIT TO THE MINES.

In connection with the above visit the following work was done by Mr. Leeson, Laboratory Superintendent, for Sir William Simpson.

WATERS.

						No. of c.c. in which B coli present.			
						100	10	1	Nil.
Obuasi		Do. 2 Pump (Native) Obuasi	..	..	..	—	—	—	I
		Brick well, Cricket Ground, Obuasi	..	..	..	I	—	—	—
		No. 2 Tap, Pipe water, Wawasi	..	..	..	—	—	—	I
		Stream, the village supply	..	..	..	—	—	—	I
		Dam surface and depth (village supply)	..	..	..	I	I	—	—
		Tank on Cote d'or Hill (European supply)	..	..	..	I	—	—	—
		Stream supplying the Tank	..	..	..	—	—	—	—
		Tap, Hospital	..	..	..	—	—	—	I
		Tap, near Hospital	..	..	..	I	—	—	—
		Office standpipe	..	..	..	I	—	—	—
		Pump "Pompura" low shed	..	..	..	I	I	—	—
Prestea	..	Adit source, Native supply	..	..	..	—	—	—	I
		Tank at Hospital	..	..	..	I	—	—	—
		Tank in Prestea village	..	..	..	I	—	—	—
Abbontiakoon	..	Underground spring, 15 level	..	..	..	—	—	—	I
		Native supply before filtering	..	..	..	I	—	—	—
		Tap, Native supply	..	..	..	I	—	—	—
		European supply	..	..	..	—	—	—	I
Tarkwa	..	Well	..	..	..	—	I	—	—
		Underground spring, 9 level	..	..	..	—	—	—	I
		Swanzy bungalow, European supply	..	..	..	I	—	—	—
		Well	..	..	..	—	—	I	—
Abosso	..	Adjah Bippro inflow to Abosso Mine	..	..	..	—	—	—	I
		2 wells near compound	..	..	..	2	—	—	—
Insuta	..	European drinking supply	..	..	..	I	—	—	—

BLOOD FILMS EXAMINED FOR PROTOZOA.

Wawasi	..	..	Children under 5 years	..	5 M.T.	..	..	infections in	19
Obuasi	..	..	" " "	..	3 M.T.	..	..	" "	17
			Mines	..	0 M.T.	..	..	" "	31½
			Grass cutters	..	0 M.T.	..	..	" "	9
Prestea	..	..	Hospital Patients	..	2 M.T.	..	..	" "	30
			Children 4-5 years	..	10 M.T.	..	..	" "	50
Abbontiakoon	..	..	Hospital Patients	..	0 M.T.	..	..	" "	1
			Children 4-6 years	..	9 M.T.	}	..	" "	30
				..	2 S.T.		..	" "	30
Tarkwa	..	..	Europeans	..	2 M.T.	..	..	" "	6
			Children under 5 years	..	15 M.T.	..	..	" "	30
			Children 5-6-years	..	11 M.T.	..	..	" "	30
			Hospital Patients	..	0 M.T.	..	..	" "	3
Abosso	..	..	Hospital Patients	..	1 M.T.	..	..	" "	25
			Children	..	13 M.T.	..	..	" "	30

ULCERS.

Obuasi	..	..	4. Showing spirochaetes and fusiform bacilli only.
Prestea	..	..	7. No organisms present in any.
Abbontiakoon	..	..	2. Spirochaetes and fusiform bacilli in one.
Tarkwa	..	..	20. { Spirochaetes and fusiform bacilli in four. Gram—diplococci resembling gonococci in five.
Abosso	..	..	14. Spirochaetes and fusiform bacilli in one.

BRIEF SUMMARY OF FAECES EXAMINATIONS MADE
FOR SIR WILLIAM SIMPSON BY MR. LEESON.

990 Samples of faeces were examined from 127 latrines stained on the following mines Tarkwa—Prestea—Abbontiakoon—Abosso and also from the Public latrines at these places.

Ankylostome ova were found 287 times or 29%.
 Ascaris " " " 522 " or 53%.
 Trichiuris " " " 88 " or 8.5%.
 Strongyloides larvae were " 21 "
 Oxyuris Were found 3 "
 Taenia saginale " " 21 "
 Bilharzia " " 3 "
 Hymenolepis " " 2 "

Mines.	Water from drives, etc.	Mud from drives.	Hookworm.	Scrapings from floors of latrines.	Hookworm.	Hookworm + Ascaris.	Hookworm + Taenia.	Ascaris.	Taenia.	Scrapings from foot boards of latrines.	Hookworm.	Hookworm + Ascaris.	Ascaris.	Scrapings from ladders.	Totals.
Obuasi ..				1										8	9
Prestea ..	2	5								7	4				14
Abbontiakoon		3	2	4			1	1		16	3	2			23
Tarkwa ..		4		11	1	1			1	11	5		1		26
Abosso ..	1	6		7		1				11	1	2	1		25
	3	18		23						45				8	97

MISCELLANEOUS.

Obuasi 100 Cochroaches examined for Tubercle Bacilli .. Negative.
 3 Rats Mus rattus
 1 Urine for Bilharzia Negative.
 30 Sputa for Tubercle Bacilli (Mines) Negative.

Prestea 29 Sputa for Tubercle Bacilli Hospital Patients 1.T.B. present.
 20 Cochroaches for Tubercle Bacilli Negative.
 1 Rat Mus rattus
 1 Urine Hospital Patient Bilharzia ova+
 1 Tapeworm from Hospital Patient T. saginata.
 2 Urines Hospital Patient Negative.

Abbontiakoon .. 9 Sputa Hospital Patients T.B. in 1. Pneumos in 3.

Tarkwa 1 Chancre for pallida Present.
 25 Sputa for Tubercle Bacilli Hospital Patient Pneumococcus in 5.

Abosso 22 Recruits Sputa for Tubercle Bacilli Negative.

Museum specimens have been forwarded, for which the Institute is very grateful, from the following Officers Dr. A. J. R. O'Brien.

Mr. P. P. Horn }
 Mr. H. T. Lucas } Sanitary Inspectors.

Practically every Medical Officer in the Colony and Protectorate has made use of the services of this Department which is very gratifying.

We desire also to record our thanks to the Director Standard Laboratory—University of Oxford for Standard emulsions and Sera of T.A.B. and Dysentery.

In conclusion it is necessary to record once more the excellent and loyal service rendered by Mr. Leeson, Laboratory Superintendent and Mr. Abbott Laboratory Assistant. It is a pleasure to work with them.

The Native staff have also rendered good service. Mr. Paittoo deserves special mention for his excellent histological work and Mr. Bannerman for his progress in staining and media making.

W. A. YOUNG,
Director, Medical Research Institute.

APPENDIX B.

Extract from a Report on the work done in the Venereal Diseases Clinic during the period 1st April, 1924 to 31st March, 1925, by Dr. C. E. Reindorf.

Taking a complete survey of the year's work under review the results have been very satisfactory.

One of the most encouraging as well as interesting features of the year's work, was the fairly large number of purely voluntary attendances of women, and also a good deal of "return" of children aged between 4 and 15 who attended the clinic in 1922 for treatment for yaws and who received only three .3 intramuscular injections of Neo-Arseno-Billon and were considered as practically cured because of the disappearance of the local manifestations.

The number of attendances in gonorrhoea patients has steadily increased, the relative large attendance of women was due to the lecture given in vernacular during the year explaining the seriousness of venereal diseases.

Of the 1,090 cases of Gonorrhoea who attended for treatment 143 defaulted whilst still capable of conveying infection. 633 were cured. The majority of the remainder are expected to attend in 1925.

It is rather interesting to observe that the steadily large increase of Chancroid pateints are from the uncircumcised portion of the community.

Attendances for Gonorrhoea are summarised below.

1921.	1922.	1923-1924.	1924-1925.
No. 284 M. F. 270 14	No. 402 M. F. 382 20	No. 733 M. F. 629 104	No. 1090 M. F. 668 422
No. ceased treatment. M. F. 93 6	No. ceased treatment. M. F. 49 9	No. ceased. M. F. 90 23	No. ceased. M. F. 82 61
No. cured. M. F. 140 8	No. cured. M. F. 217 11	No. cured. M. F. 510 54	No. cured. M. F. 493 140
	SOFT CHANCRE		
1921	1922	1923-1924	1924-1925.
12	31	162	249

The number of attendants in syphilitic cases in both males and females has considerably increased. Syphilitic women appear less inclined to seek relief early in the disease than do the men, particularly in the primary stage, but both cases and attendances for late secondary or tertiary syphilis are as numerous as amongst men.

The following table shows cases and attendances by sexes for the past four years:—

1921 Cases 70.

Sy. I.	Sy. II.	Sy. III.
M. F. 25 1	M. F. 15 3	M. F. 16 10
No. ceased. M. F. 15 1	M. F. 26 5	M. F. 3 4
No. Full Course. M. F. 4 —	M. F. 5 1	M. F. 4 2

1922 Cases 152.

M. 62	F. 4	M. 36	F. 26	M. 10	F. 14
No. ceased.					
M. 2	F. 3	M. 5	F. 10	M. 3	F. 2
No. Full Course.					
M. 2	F. —	M. 4	F. 1	M. 2	F. —

1923-1924 Cases 507.

M. 131	F. 14	M. 102	F. 87	M. 77	F. 96
No. ceased.					
M. 4	F. 2	M. 5	F. 4	M. 10	F. 14
No. Full Course.					
M. 16	F. 5	M. 12	F. 8	M. 5	F. 2

1924-1925 Cases 1,330.

M. 367	F. 6	M. 156	F. 182	M. 328	F. 291
No. ceased.					
M. 62	F. —	M. 30	F. 30	M. 41	F. 53
No. Full Course.					
M. 130	F. 3	M. 54	F. 49	M. 53	F. 52

No. of total Patients treated	..	..	4,400
No. of Gonorrhoea Patients treated	..	..	1,090
No. of Syphilitic Patients treated	..	..	1,330
No. of Framboesic Patients treated	..	..	1,731
No. of Injections of N.A.B.	..	..	17,484
No. of Injections of Mercury	..	..	8,151

APPENDIX I.

RETURN SHOWING NUMBER OF CASES TREATED IN THE VENEREAL CLINIC FOR THE YEAR, 1924-25 INCLUDING DISEASES OTHER THAN VENEREAL SUCH AS YAWS, PHIMOSIS, BALANITIS—NON-SPECIFIC RASHES ETC. AND NOT INCLUDED IN FIGURES OF ANIMALS.

	Primary Syphilis.		Secondary Syphilis.		Tertiary Syphilis.		Congenital Syphilis.		Soft Chancre.		Gonorrhoea.		Diseases other than Venereal.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
I. Remaining under treatment Ist April, 1924	86	2	63	67	49	79	—	—	—	—	9	34	380	320	587	502
New Cases	367	6	156	182	328	291	—	—	249	—	668	422	403	378	2,171	1,279
II. (a) Completed I Full Course ..	107	3	50	21	40	32	—	—	—	—	—	—	135	178	332	234
(b) Completed II Full Course ..	23	—	23	16	22	18	—	—	—	—	—	—	68	60	136	94
(c) The Full Course	—	—	—	—	—	—	—	—	—	—	364	171	—	—	364	171
(d) The Full Course with final test..	—	—	—	—	—	—	—	—	—	—	150	—	—	—	150	—
(e) Ceased to attend before completion of Full Course	62	—	30	30	41	53	—	—	—	—	82	61	98	79	313	223
III. Discharged after completion of Course	23	—	23	16	22	18	—	—	—	—	150	—	68	60	286	94
IV. Remaining under treatment Ist April, 1925	261	5	116	182	274	267	—	—	—	—	81	224	482	381	1,214	1,059

APPENDIX C.
ANALYTICAL CHEMIST.

CHEMICAL LABORATORY,
ACCRA.

REPORT ON THE WORK DONE DURING THE YEAR APRIL, 1924 TO
31ST MARCH, 1925.

The number of samples dealt with was 283 and comprised the following :—

Medical and Police Departments—

Examinations for poisons—

Human viscera	..	..	..	..	..	..	6
Stomach contents	..	..	..	..	..	..	4
Vomit, Urine, Faeces	..	..	..	..	..	..	3
Native " medicines "	..	..	..	..	..	..	3
Cooked foods ..	..	..	..	..	..	..	8
Drugs	..	..	..	..	..	..	6
Domestic utensils	..	..	..	..	..	..	3
Water ..	..	..	..	..	..	..	2

Examinations for bloodstains—

Clothing	..	..	..	..	..	..	3
Weapon	..	..	..	..	..	..	1
Counterfeit coin	..	..	..	..	..	..	1
						40	

Medical and Sanitary Services—

Drugs for purity	..	..	..	..	..	..	5
Waters	..	..	..	..	..	..	2
Waters for Sir Wm. Simpson	..	..	..	..	..	..	—
Mineral analysis	..	..	..	..	..	..	6
Potable do.	..	..	..	..	..	..	24
Partial do.	..	..	..	..	..	..	13
Sodium Potassium Bismuth Tartrate	..	..	..	..	..	..	22
						72	

Customs Department—

Patent medicines	..	..	..	..	..	..	44
Potable spirits	..	..	..	..	..	..	12
Wines	..	..	..	..	..	..	28
Medicinal wines	..	..	..	..	..	..	7
Liqueurs	..	..	..	..	..	..	13
Perfumed spirits	..	..	..	..	..	..	36
Beer and Stout	..	..	..	..	..	..	14
Miscellaneous ..	..	..	..	..	..	..	11
						165	
Miscellaneous	..	..	..	..	..	..	6
						283	

The analyses of human organs and stomach contents were made in connection with four deaths from suspected poisoning.

In one instance only was poison found. This was a trace of Croton oil in a vomitus obtained from a man on admission to hospital. His death which shortly ensued was found by a Coroner's Jury to have been caused by a dose (estimated at 3 c.c.) of Croton oil.

In this case there was most violent purging and vomiting and, though the fatal dose of Croton oil is not known with certainty as the cases recorded are few and indefinite, it is undoubtedly small; thus, it was no matter for surprise that none of the poison was detected in any part of the alimentary canal which exhibited evidence of intense irritation throughout.

A bottle which was proved to contain Croton oil was among the effects of the deceased

No poison was found in any of the specimens of native " medicines," foods etc. submitted and comment is again made upon the nebulous character of the available information. accompanying the majority of alleged poisons and poisoned materials.

Bloodstains were found on two of the articles of clothing submitted in an alleged case of murder and none on the weapon.

43.0 Analyses of waters from the various mining districts were made at the request of Sir William Simpson during and after his visit to the Colony.

As the result of an article published in the Annual Report of the Medical Department in Kenya Colony for 1923, a request was made for the preparation of Sodium Potassium Bismuth Tartrate. This compound has been used in Kenya for the treatment of Yaws, the cost of a dose working out at 1/10th penny as contrasted with three shillings in the case of Novarsenobillon.

The procedure in the report was followed as closely as the description permitted, but in the course of eleven experiments varying method and proportions of ingredients slightly it became evident that this salt is not of definite constitution and the Bismuth content of each preparation differed from the others.

The first three attempts at preparation resulted in Bismuth contents of 48, 41.5 and 46 per cent.

Each of these was kindly tested by the Acting Director of the Medical Research Institute for toxicity on guinea pigs, the dose injected into the thigh muscles being approximately 20 mgm. per kilo body weight.

The actual injections appeared to cause considerable pain but this disappeared immediately, there were no subsequent ill effects and all the animals put on weight.

Attempts to obtain a compound containing more than 50% Bismuth were unsuccessful and the final bulk contained 47.5%.

All determinations were carried out gravimetrically as the volumetric method mentioned in the Kenya report did not appear to be reliable.

The final specimen of this compound, a white crystalline powder, dissolved completely in cold distilled water in the proportion used in Kenya, the dose being 0.2 gramme in 2 c.c. sterile water, the solution was clear, very faintly acid and withstood being boiled without undergoing change.

Each specimen prepared was extraordinarily hygroscopic and very quickly became sticky on exposure to this humid atmosphere, a property which necessitated the use of large quantities of absolute alcohol in the final stages of manufacture.

The Police submitted a counterfeit florin of local manufacture for examination and it was found to consist entirely of Lead.

The Customs Department again submitted a large number of Patent Medicines for the determination of their alcoholic content and possible potability as alcoholic beverages. The classification and potability of perfumed spirits and other spiritous compounds were ascertain by analyses; these discriminations under the new Customs Tariff involve important details of revenue.

144 litres of denatured condemned spirits were distilled and 98 litres of 80% alcohol recovered; also 70 litres of condemned German rum were saponified and on distillation yielded 34 litres of 80% alcohol.

During the period under review I was absent on leave from the Colony for two months.

ROBERT SIMMONS, F.I.C.,
Analytical Chemist.

APPENDIX D.

YELLOW FEVER AT NSAWAM—THE CASE OF MR. C.

On July 15, Mr. C. an employee of the Societe Commerciale de l'Ouest Africain was brought into Accra European Hospital at 1.45 p.m. from Nsawam where he had been attended by Dr. Dove.

The following history was elicited from patient and from his colleague Mr. Lawrent who brought him down from Nsawam:—Mr. C. was suddenly taken ill with fever on Thursday evening July 10th. On Friday night he was very ill with frontal headache. No change on Saturday. On Sunday vomiting of matter "like cocoa." On this day he took dose of urodonal.

On admission: Fever with slow pulse (Temp. 102.4 Pulse 78) Yellow sclerae. Tongue dry with brown fur down the middle. Nausea and epigastric discomfort. Lips cyanosed. Vomited a small quantity of fluid containing small brownish matter; these under the microscope showed washed out erythrocytes with patches of Haemoglobin. Blood, no parasites, no pigment. Urine: acid, 10 ozs., Turbid with cellular debritus and grandular casts. Heavy deposit of albumen on boiling and acidification for bile.

July 16.—Occasional vomit similar in character to yesterday's. Black fluid stool. Numerous patchia have appeared on the skin of the entire body. Is taking fluids very well.

July 17.—Remission of temperature. Urine more scanty. Albuminous and is full of casts. There are now thousands of patchia from the head down to soles of feet, they cover the entire skin and vary up to $\frac{1}{3}$ " in diameter. Very restless and delirious all night. Says he feels very well.

July 18.—Temp. rising with increased frequency of pulse. Urine very scanty—albuminous and full of casts. Tongue dry and brown. Vomited several times during night but not since receiving an intravenous injection of isotonic glucose oz. 14 at 9 a.m. At 2.30 p.m. a further 20 ozs. was given intravenously. He is delirious. Occasionally hiccough

July 19.—Very restless night. Urine very scanty—none passed since 12 a.m. He vomited repeatedly—typical black vomit. Intravenous glucose solution oz. 40. Hiccoughing continually.

July 20.—Intravenous glucose at 7 a.m. and 1 p.m. Has lost consciousness of his surroundings since 7 p.m. yesterday. Very restless. Prepulsive vomiting of black matter. No urine. He died at 4 p.m.

G. E. H. LE FANU,

Medical Specialist,

Accra, 31.7.24-

APPENDIX D—(continued).

MEDICAL RESEARCH INSTITUTE,
P.O. Box 300,
ACCRA, 25TH JULY, 1924.

REPORT ON AUTOPSY ON CASE OF YELLOW FEVER.

Patient's Name. C. *Age* 23. **Sex** M. **Nationality** French.

Date of Autopsy. 21st July, 1924. 10 a.m.

Date of Death. 20th July, 1924. 4 p.m.

General The body is very fat.

Rigor mortis is slight in arms and well marked in legs. Brights red blood stained fluid has issued from mouth and nostrils in such quantity as to soak the clothing.

Decomposition .. Is progressing with usual rapidity. Death occurred 18 hours previous to autopsy the atmospheric temperature being 74 to 78 F.

Around neck and over upper part of the chest there is a diffuse crepitant swelling. There are small blebs on the thighs and bubbles of gas under the spleen capsule. The odour is characteristic of decomposition

Skin Post-mortem lividity in dependant half of the body is well marked.

Elsewhere the skin is distinctly yellow and shows numerous large and small petechial hæmorrhages.

Conjunctiva .. Sclerae and conjunctivae are distinctly yellow and show numerous hæmorrhages.

Connective Tissues Show a uniform pale yellow tinge.

Heart A few petechial hæmorrhages on the surface, otherwise normal.

Lungs Much congestion at basis. No pleural petechial noticed.

Liver Very soft. Surface is very pale and but slightly mottled. On section liver appears very pale with a yellow tinge *i.e.* boxwood colour.

Spleen About three times normal size. Otherwise normal.

Kidneys Distinctly enlarged, the cortex being thickened. The intermediate zone is much injected.

Stomach Is much distended with gas and contains about 6 oz. of dark brown, almost black, fluid. The mucous membrane at the cardiac end is uniform dark red colour ; at pyloric end it shows only a few red streaks.

Considering the state of decomposition the changes in the mucous membrane are slight.

Peritoneum .. No petechial hæmorrhages noticed.

APPENDIX D—(continued).

MICROSCOPICAL EXAMINATION.
PARAFFIN SECTION STAINED WITH HAEMATIN AND V. GIESON.

Liver Shows extreme degenerative changes.

Many cells seem to have disappeared and there are wide spaces between those remaining.

The cells are arranged in disorderly fashion there being no trace of the normal columns.

Most of the remaining cells are occupied by large vacuoles. The healthiest cells are seen nearest the portal canals, while those around the efferent veins are rather better preserved than the average.

Therefore the intermediate zone of the lobule shows the greatest changes.

Kidney The vessels are much engorged, the cells of the convoluted tubules are broken down into granular debris the nuclei, in most places, being quite invisible, and there are proliferating cells within the capsules of the Malpighian bodies. Round celled infiltration is not evident.

The changes therefore are mainly degenerative, but probably due in part to decomposition.

Summary The post-mortem appearances may be considered typical of yellow fever. Features deserving comment are the rapidity of decomposition and the cutaneous rather than the internal situation of the petechial hæmorrhages.

A. S. BURGESS,

Acting Director, Medical Research Institute.

THE HON : D.M.S.S.,
ACCRA.

THE CASE OF MR. M. GENERAL FITTER, PUBLIC WORKS DEPARTMENT.

Mr. M. was reported ill on May 17 and brought into hospital from the Water Works at Wejia where he had been stationed for some time. His Temperature on admission was 103.6 pulse 96. He did not complain of any special symptoms, and said he had been ill for two days. He was extremely deaf and it was next to impossible to question him. His blood was examined and found free from parasites and pigment. The urine was free from albumin.

On May 18th his condition appeared unchanged. His blood was again examined and found free from parasites and pigment. The fever continued, the temperature dropping twice to 99.8 and 100 after a diaphoretic powder (Aspirin gr. 10 Phenacitin gr. 5, Dover gr. 5). His temperature on this day rose twice over 104° F, 104.6° at 10 a.m. Pulse 92, 104.2° at 6 p.m. Pulse 90.

On May 19 Mr. M. did not appear so well as on the previous two days and suffered from nausea. The urine contained casts and albumin.

On May 20 the temperature was falling, slight jaundice appeared in the sclerae and yellow Fever was suspected for the first time. At 12 noon Mr. M's temperature was normal and he was reading the paper. No urine had been passed and 4 ozs. was withdrawn and found to be highly albuminous : casts were no longer present.

Early in the afternoon his condition suddenly changed. The respirations became frequent and irregular. He became delirious and vomited some brownish material just before death which took place at 6 p.m. His brother, Principal of the Technical School was with him towards and at the end.

A Post-mortem was performed at 7 a.m. on May 21st by Dr. W. A. Young and Dr. Burgess of the Medical Research Department, and the cause of death ascertained to be Yellow Fever.

G. E. H. LE FANU,

Medical Specialist,

Accra, 15th June, 1924.

APPENDIX D—(continued).

REPORT ON POST-MORTEM FINDINGS ON
Mr. M. GENERAL FITTER, P.W.D.

Mr. M. Aged 53, European took ill May 15th, died May 20th, 6 p.m. was post-mortemed 7 a.m. May 21st.

General appearance The body was that of a well-made, well nourished man, Rigor mortis was present in arms and legs. Post-mortem lividity was very marked especially in the dependent parts, and entirely round the neck.

The skin was of a light pale yellow, the face somewhat darker. The conjunctivae, though slightly were distinctly yellow.

The connective tissues and fat were just slightly more yellow than usual especially round the kidneys. (A fact I have noticed repeatedly in Y.F. Post-mortems is the apparent freshness of the tissues. There is no septic smell and no smell of degenerating tissues) No petechiae noticed on the skin.

Respiratory System On moving the body dark red fluid ran from the mouth. It was not frothy. The lungs, heart, trachae and larynx were removed *en masse*. The trachae and bronchi showed haemorrhages and conjection of the mucous lining, which was covered by a dark brown viscid material. The lungs were very unusual. Of a markedly dark colour, they were slightly mottled above—deepening in colour downwards till in the posterior bases they appeared like lumps of well set black current jelly. The right lower lobe showed a distinct raised edge around one area about 3" square. This mass was a large haemorrhage the remaining parts being a series of multiple haemorrhages. This condition judging from the clinical symptoms only, appeared shortly before death and of course Post-mortem one realised a man could not live long with such a state of affairs. Pleura apparently normal except slightly darker and yellow. No obvious petechiae.

Heart Valves normal—muscle apparently good though flabby and soft. In diastole. Petechiae under endo-cardium noticed in the papillary muscles. Pericardium showed no petechiae.

Liver Normal in size—soft—light brown in colour distinctly boxwood on section. Distinct yellow edge. Very fatty.

Spleen Enlarged and markedly congested.

Stomach Dark grey viscid contents with fly specks. The cardiac end was congested in patches and showed erosions and punctate haemorrhages.

The pyloric end was apparently normal.

(This is the opposite to what is described as the usual condition ; see Byain and Archibald page 1236 Vol. 2).

Kidneys Pale—yellow—congested—fatty and enlarged. Capsule stripped easily.

Intestines Showed slight haemorrhages beneath the peritoneal covering. No suggestion of recent malaria.

W. A. YOUNG,

Acting Director, Medical Research Institute.

APPENDIX E.

A REPORT ON THE BIRTH-RATE AND INFANT MORTALITY
IN THE KOFORIDUA DISTRICT.

The register of births has been so little patronised locally, that in order to obtain information with regard to the Birth-rate and Death-rate of infants, I resorted to the tedious method of questioning individuals with whom I came in contact.

The figures from which the following averages, and percentages are derived, were obtained from the women who came to the dispensary. These were of two classes :—

- (1) Those who came to consult me with regard to some illness of their own, these included a number of completely or partially barren women out of proportion to the general population.
- (2) Those in normal health who brought sick children for treatment.

Though I kept no count of their relative numbers, I can say that the latter were much in excess of the former.

Only females of sufficient age and over to have co-habited with a man for a year were questioned. This age I judge at the lowest to be about 16, for from my observations I gather that the first menstruation appears late here, between the 14th and 15th year, and that marriage rarely takes place before six menstrual periods have passed.

Women of origin distinctly foreign to this region were excluded, but Ashantis, Akims, Akwapims, Krobos, Gas, Fantis, etc., were included, for a good deal of inter-marriage has taken place, and, the women of such tribes can lead their normal lives here.

The total number of women questioned is 1,000.

A note was made of the age of each woman. To estimate the age of woman white or black is notoriously difficult and though practice may improve it does not make perfect. Absolute accuracy was not attempted, ages were grouped by fives from "below twenty" to "45 and over." The removal of the headkerchief assisted judgment. The request to take it off was always willingly complied with, often laughingly when it became evident that the wearer did not openly acknowledge all the rainy seasons she had seen. In some cases the number of children stated to have been born was so great, that a low estimate of age had to be reconsidered. Several women noting my surprise at the fecundity they claimed, volunteered the information that since marriage they had had a child every eighteen months.

The following information was obtained from each woman.

1. Total number of children born.
2. Total number alive.
3. Number of those amongst the deceased children who had been able to walk about.
4. Number of miscarriages.

The third point was needed in order to draw a line between infants and others. It does not make a straight line, and would run I think between the ages of $2\frac{1}{2}$ and 4. Nevertheless, I consider that until a child can walk alone, it adheres to the infant's mode of life without regard to its exact age, but waiting on development to make the change. In my notes, only those who died as infants were subtracted from the total number born, and the remainder given as "number surviving infancy."

I interested myself in the number of miscarriages with a view to discovering whether those conditions which produce miscarriage were having much influence on the birth-rate.

It would have added to the interest of this paper to have known the average age at death of local women, with it the average child production per woman, could have been calculated, but the figures given for ages in the Register of deaths are unreliable.

My figures totalled as follows :—

- 1,000 women.
- Average age 25—30.
- Number of children born 3,666.
- Number which survived infancy 2,742.
- Number of miscarriages 422.
- Average number of children born per woman 3.6.
- Average number of children surviving infancy per woman 2.7.
- Average number of miscarriages per woman 0.4.
- Average conception rate per woman 4.0
- Infantile death rate 252 per 1,000.
- Loss on conception rate 329 per 1,000.

In this connection it may be of interest to compare the following few statistics from other countries. They are culled from old copies of the "Lancet."

The lowest recorded infantile mortality for England and Wales, is given as 80 per 1,000, in 1921 it was 83 per 1,000.

In 1914 New York had an infantile mortality of 95 per 1,000 and it is claimed that this at the time was the lowest infantile mortality recorded among the great cities.

The infantile mortality for the North West Province of India for 1921 was 162 per 1,000, for 1922, 195 per 1,000.

Delhi had in 1919 an infantile mortality of 268 per 1,000, in 1920 the lowest record was made 232 per 1,000.

Calcutta in 1920 lost infants at the rate of 386 per thousand.

Grouping the women I questioned according to age, gives the following result :—

45 were under 20 years of age.
 276 were between 20 and 25.
 380 were between 25 and 30.
 154 were between 30 and 35.
 73 were between 35 and 40.
 72 were over 40 years of age.

More than half are between the ages of 20-30 ; the older women follow the old custom and prefer to put their trust in fetish healing, the youngest women are guided by their mothers.

Seventy-two women were over the age of forty, and I consider them as at or about the end of the child bearing stage of life. They had born between them a total of 493 children of whom 370 survived infancy. They had between them 79 miscarriages.

Average number of children born per woman over 40—6.8.

Average number surviving infancy 5.1

Average number of miscarriages 1.1.

Average conception rate—7.9.

The number collected is too small to give a certainty of fact, but is still of use in giving an idea of local fecundity.

The following are the best examples of fecundity and good motherhood :—

Age.	Number born.	Surviving Infancy.	Miscarriages.
50-55	11	11	0
45-50	13	11	1
45-50	11	11	0
40-45	11	11	2
35-40	13	12	0
30-35	11	10	0
30-35	8	8	0
25-30	8	7	0

The highest number of conceptions claimed by any woman is 14.

The highest number of children claimed to have been given birth to, 13 in two instances.

The highest number surviving infancy 12.

Cases exemplifying fecundity with poor motherhood are not uncommon, *e.g.*, age 30-35, number of children born 10, number surviving infancy 4, miscarriages 2.

Forty-eight women said that they had born no living children, of these 10 had had miscarriages.

Six under 20 years old had no miscarriages of 19 between 20-25 years, five had miscarriages of 16 between 25-30 years, four had miscarriages of three between 30-35 years, one had two miscarriages of two between 35-40 years none had a miscarriage two were over 40 and had no miscarriages.

As may be expected my work has led me to form an opinion as to the main cause of infant mortality. I present it with diffidence.

I have found enlarged spleen combined with periodic fever in children three weeks old. A really impalpable spleen in a child between the ages of two months and two years is a rarity in this district. A history of periodic fever, is as seldom absent; an account of shivering fits and convulsions accompanies especially those fevers with a periodicity of "two to three times a week." Anaemia is very common amongst infants, and is frequently pronounced amongst those apparently well nourished. It may therefore be deduced that malaria is rife, a deduction readily substantiated by the microscope.

The malarious infant generally has a cough, often without physical signs in the chest, perhaps a bronchial catarrh abetted by the upward pressure of enlarged liver and spleen in an abdomen, over distended by gas producing food.

More than fifty per cent. of the children are fed on cereals before they have started dentition, many at the age of six months, and toothless, share freely in the meals of adults though their digestive organs have early been debilitated by chronic malaria, as witness the hepatic enlargement and common occurrence of mucous in the stools.

Such an anaemic, fever stricken dyspeptic infant is daily taken out into the compound in the cool of the evening, and bathed in cold water. It is exposed naked to the sun and equally so the chilly air after a rain storm. In its febrile state, its heat regulating apparatus functions badly. It is fed on any food at any hour of the day. What wonder that it fails to digest, what wonder that its trivial cough becomes an acute bronchitis or broncho-pneumonia. Ascaris infection it is likely to have from early infancy (6-8 months) increasing both the respiratory and intestinal trouble. Its life is a precarious one. The most frequent cause of death cannot be said to be malaria or pulmonary disease or malnutrition with intestinal infection, but rather a varying combination of the three.

The onset of yaws luckily occurs more frequently when the child is able to walk about and comes in close contact with other children, by that time it has generally gained some mastery of its earliest ailments.

Prostitution is a minor cause of mortality for mother and child.

The contracted pelvis is much rarer than in Europe. Malposition of the foetus is not common, but inertia due to anaemia resulting from malaria is very common. The woman rarely succumbs. The offspring of the cachectic mother often dies during the prolonged confinement or in its first week of life.

The post natal care given to infants in this district is practically identical with that given in Europe, and having mentioned this subject I may be allowed to digress and speak of the very common umbilical hernia of infants which I believe to be commonly attributed to faulty and septic treatment of the cord.

So far as I know umbilical hernia of infants is very rare or non-existent in parts of the world outside West Africa. Faulty and septic treatment of the cord is common in all the world. In the West African infant the normal volume of the intra-abdominal contents is often greatly increased by enlargement of liver and spleen and by gas-producing food. In the more malarious parts of South America an equal increase of intra-abdominal pressure is frequently found, but leads only to general abdominal distension. I incline to the view that this type of hernia is due to a peculiar racial weakness of the naval scar. In any case it seems to interfere but little with the happiness of the child or its parents, and generally disappears in a few years.

Amongst the thousand women dealt with, the average number of miscarriages per woman is 0.4.

I do not know whether this compares favourably or not with the averages of other lands.

As a cause of miscarriages, syphilis comes first to mind. In ten of my thousand women a suspicion of syphilis could reasonably be entertained, but though gonorrhoea is common in the class of life from which they are drawn, syphilis is clinically rare—rarer than one per cent. of adult women. I am tempted to think that yaws—so prevalent here—gives a partial immunity to syphilis, a complete one I know it does not give in this locality.

A common history given by women who come seeking advice about miscarriages, is the onset of fever shortly after conception, a remittent fever of considerable intensity, usually accompanied by chronic constipation. It is my experience that malarial parasites are found more frequently in the peripheral blood of pregnant women than in other adults. James* refers to the placental sinuses as the optimum habitat of the asexual forms of *P. Falciparum*. The adult West Africans' power of resisting Malaria seems diminished in pregnancy and I consider these fevers the commonest cause of abortions.

In conclusion the reader will have realised that this short paper is replete with inaccuracies, errors will inevitably enter into statistics collected in the manner I have described. Errors attend upon the use of such limited numbers for statistical purposes and I know that errors are inevitable in opinions drawn from my clinical experience. Nevertheless, I have had the temerity to present this report in the hope that it may be of some general interest.

* The localisation of Malarial Parasites in Man. (Proc. Internat. Conference on Health Problems in Trop. America 1924) Trop. Diseases Bulletin Vol. 22. No. 5.

J. M. O'BRIEN,

Senior Medical Officer,

Koforidua, 27-6-25.

APPENDIX E—(continued).

A NOTE ON THE EFFICACY OF PROPHYLACTIC QUININE.

Mr. A. an Englishman age 35 in his fifth tour, consulted me on the morning of the 16th June, 1925. He complained of having had indigestion for two or three days, of some headache and general seediness. The evening before he had gone to bed at 7.30 after a light meal.

He experienced no feverishness.

His temperature was 98.0 F. A general examination revealed nothing. Spleen and liver were normal. I know him to be moderate with alcohol, and to be a fairly heavy smoker.

Some three months previously when just returned from leave, he had asked my opinion with regard to prophylactic quinine. I counselled ten grains daily, he himself, anxious to keep fit and well, though not particularly prone to malaria proposed that it should be in solution. He asserted that since that time he had not failed to take his daily dose. His bottle (a twelve ounce one) lasted him "about ten days."

I put faith in his statement, and on that account in attempting a diagnosis I eliminated malaria. I sent the patient to bed mainly on the grounds that he was not the type to give in unless he felt really ill. I instructed him to continue with his quinine, and to take at once a table spoonful of castor oil, if he desired any food, to limit himself to a slop diet.

Visited at 6 p.m. his temperature was 98.2 Pulse 64 he had had one motion, general condition unaltered.

Next morning at 8 o'clock he felt much better, he had had three motions during the night, but slept well. He expected to be allowed to go to work, but the fact that his temperature was 98.8 (pulse 70) decided me to keep him in bed. The urine contained no albumen and no sugar.

At three p.m. I was sent for and found the patient tossing about in bed with an agonising headache. (He had received a gunshot wound in the head during the war). His temperature was 100. Pulse 100. Pupils reacted normally, there was no injection of the eyes. The knee jerks were normal. He was given aspirin gr. 5. At six p.m. the temperature was 100.6 pulse 100, the headache was worse, so severe that the patient had difficulty in keeping control of himself. A blood smear was taken. A powder composed of aspirin gr. 5. Phenacetin gr. 5 Pulv. Ipsacac Co. gr. 5 was ordered.

On the 18/6/25 the blood smear was examined early, and found to contain a considerable number of small ringed malarial parasites. The patient when visited at 8 a.m. was found very tired, he had sweated much during the night and slept little. He had still much dull headache. The temperature was 97.8, pulse 72. The urine was dark but otherwise normal, tested with Mayer's reagent it showed the opalescence which quinine gives. The following mixture was ordered. Mist. Quinine (grs. 10 ad) , Syrup aurant qs Aquam ad t.d.s. Convalescence was rapid, uneventful, without further rise of temperature or exacerbation of symptoms.

I sought corroboration of the statement that the patient had really been taking ten grains of Quinine sulphate daily. He shares his meals with a friend. The friend stated that he had never known the patient to miss taking his daily dose from his quinine bottle. If Mayer's reagent is to be trusted the quinine was being absorbed, and the patient was taking no other drug which might interfere with the test.

Therefore it seems that ten grains of quinine daily will not always prevent malarial parasites from appearing in the peripheral blood, and will not always prevent a sharp attack of fever.

And thus I lost a trusted clinical axiom.

J. M. O'BRIEN,

Senior Medical Officer.

Koforidua, 2nd-6-25.

APPENDIX F.

A METHOD OF EXCRETA DISPOSAL IN THE TROPICS WHICH ENTIRELY PREVENTS FLY DISSEMINATION BY MAJOR A. L. OTWAY, M.B., D.P.H., R.A.M.C. (SECONDED) MEDICAL OFFICER OF HEALTH, SEKONDI, GOLD COAST (WITH DIAGRAMS).

It is admitted that sewage disposal in the tropics has always been a thorny problem, that is to say where a water carriage system is not in force; this is usually the case in this part of Africa and in India. Water carriage is the exception for reasons of finance, shortage of supply, difficult country, etc. We are, then, left, for practical purposes, with two main systems:—

(1) Incineration;

(2) Earth Disposal into (a) Shallow trenches, (b) Deep pits; while the latrines themselves can be divided into three main groups:—

(1) Dry Closet, bucket latrines for bungalows and better class houses;

(2) Bucket or pan latrines for the native population;

or (3) Deep pit latrines for the same class as (2).

The contents of all the buckets have to be removed to their final place of disposal by various methods of carriage—*i.e.*, head, cart; motor; suiting the local needs and labour; and then have to be disposed of by burning or some form of earth disposal.

The main objects which the Sanitarian in the tropics has in view are, to—as far as possible,—prevent flies breeding from the excreta when disposed of, and to prevent any nuisance taking place.

The prevention of fly breeding from excreta disposal places has always, up to the present, been our greatest difficulty and one of extreme importance to carry out efficiently.

I claim to have solved the problem in a simple, inexpensive and definitely efficient manner and one which meets the needs of:—

(1) The private bungalow or groups of such.

(2) Municipal needs.

(3) For Cantonments in India in Special cases.

(4) The Army.

(b)

At the Base or in Stationary Camps when at war, or, indeed, any place where bodies of men halt for any period.

In all cases I am assuming that incineration or water carriage is not possible.

On taking over the duties of Medical Officer of Health, Sekondi, I found that for reasons of finance, shortage of water, extremely hilly and difficult country that the dry closet, bucket or pan, and deep pit latrines were in force. The contents of the bucket and dry closets being disposed of into:—

(a) Deep pits.

(b) The sea, or sand pits on the beach where practicable.

This system cannot at the moment be improved upon.

A water carriage system is almost impossible to contemplate, certainly as far as the Residential area is concerned. Bungalows are perched on a series of spurs standing over and running down to the sea. Even if water were available, very special means would have to be devised to check or control the flow of sewage coming down a sewer from one of the spurs; so that serious damage or bursting would not occur owing to the severity of the gradient.

Incineration can for the present be ruled out here.

Shallow trenching also cannot be adopted owing to the shortage of suitable ground, and the hilly nature of the country, together with extremely violent rains which would wash out any such system in a few minutes.

Dumping at sea from a Hopper barge cannot be done owing to the surf, etc.

Removal by motor lorry to a special area is not possible under present conditions.

Thus we have to fall back on disposal in deep pits or trenches as our only practicable method here.

I have proved beyond doubt that flies breed in tens of thousands from :—

- (a) Deep pits into which excrement is deposited.
- (b) Deep pit latrines.

These pits hatch flies at all hours of the day and will, when opened to deposit fresh excrement, let the same number out in batches. Spraying with IZAL, crude or diluted, has been tried both in these deep pits and in pit latrines and has been found to make no appreciable reduction in the breeding of flies, even when done with the most extreme care.

The essential principles involved are :—

- (a) do what you will, flies will continue to hatch out in pits ;
- (b) will be found as winged insects there ;
- (c) will make their escape if and when the pit is opened, or from any aperture where light is let in.

I have proved *that the newly developed fly makes directly for the nearest point of light to get out and obtain food.* This fact provided me with my line of attack on him.

After experimenting I found that if the pit is kept completely dark, except where light is *designedly admitted* and a fly trap placed, all flies, as they hatch out, will (this being the only light spot), go into the trap and there remain.

To prevent fly breeding it is only necessary :—

- (a) to construct a roof and sides over the pit area for weather protection ;
- (b) to seal over the top of the pit itself ;
- (c) to place a tight and *light-excluding* lid over the filling hole ;
- (d) to construct a fly trap at the other end, into which all flies will inevitably go, being attracted towards the light.
- (e) substitute buckets or pans for pit latrines in all cases and empty their contents into "trapped pits" close at hand.

Working on these principles I have had pits constructed which fulfill all the above conditions.

Excreta disposal pits as I use them are, in general, some 18 to 20 feet long, 3' 6" to 4 feet wide and 12 to 16 feet deep, depending on the soil.

The sealing of the pit is done by placing bush timber joists covered with palm leaves and beaten earth—called "swish" which is then tarred or treated with heavy oil. A hole is left at one end for the trap, and the filling orifice is placed at the other end and not less than 6 to 10 feet from the trap.

The whole pit is then protected by a thatch or palm leaf roof and sides supported on bush timber. The area protected extends some 2 to 3 feet all round the pit. In a country like the Gold Coast where the rains are violent it is of paramount necessity to look to the weather protection of these disposal pits ; otherwise they would be washed out.

If they are constructed on the side of a steep hill ; and some of mine are on gradients of 1 in 3 or thereabouts, it is also necessary to dig a "protection" drain some 20 feet above and also to carefully drain the immediate margin of the protecting hut or else a "wash-out" may place.

The sketches following plainly illustrate the construction of such a closed "fly trapped" pit for contents of latrine buckets, and the detail construction of the fly trap. Also a pattern for the cone.

My trap is constructed as follows :—

A wood eight gallon petrol case, size $20\frac{1}{2}" \times 10\frac{1}{2}" \times 14\frac{1}{2}"$ has the top taken off.

- (a) In the centre of the bottom a six inch circular hole is cut.
- (b) A copper gauze cone is made after the fashion of a lamp shade, bottom diameter 7", top 3", height 5" and is then fixed with its broad end over the hole and projecting up into the box ; a few small nails do this.

- (c) Copper gauze is then stretched over the top of the box and fastened round the edges with wood battens, this is necessary because it will be found that anywhere it is loose at the edge and seems to offer the least chance of escape the flies will be found in a tightly packed mass, and, if the netting is at all loose, they will finally worm their way underneath.
- (d) Make two openings 9" by 6" in the sides, and two of 4" by 3" in the ends of the trap, and cover with gauze ; this greatly helps observation of the flies from the top. It is difficult to see the flies, looking through gauze or netting from light towards darkness.

It is important to remember not to let any gauze project beyond the bottom of the box at the edge of the wood circle, as if anything in the nature of a loose edging occurs the flies get trapped on the under edge of the box and so are prevented from getting into the trap.

Make the gauze cone by first cutting a paper pattern just like a " Peter Pan " collar. Then cut the gauze and bend it till the edges overlap. Join up with a piece of copper wire interwoven in the mesh. This makes a strong and perfect cone.

I have actually made the filling orifice out of a dustbin from which I removed the bottom. This was sunk down to nearly floor level and has an excellent tight fitting lid. This, as a matter of fact was the suggestion of one of my African Inspectors and shows his real interest.

This is an improvement on the corrugated iron lid originally devised by me and is more fool proof and sanitary.

I have had the lid further covered with a loose fitting canvas cover through which the handle projects. This is to prevent any possibility of light entering round the rim should it not fit exactly or be perfectly placed in position.

The reasons that made me place the extra canvas or sacking cover on the lid are two :—

One day on opening the lid to look into the pit and see if any flies would come out, I found that some did so, actually some 20 in a bunch. This caused me to suspect that there must be some tiny point of light at the filling orifice which attracted a few flies. This proved to be the case and the lid was found to fit badly in one part, though not leaving a space for flies to get out.

I had another pit under construction and approaching completion so I and my Superintending Sanitary Inspector, Mr. P. P. Horn, to whom I owe much for his enthusiastic support, determined to go down into this clean pit and there be sealed up with the fly trap and filling aperture fitted. In other words we wanted to see " what the fly sees." We particularly wanted to know how much light came into the pit and if the " light spot " was plain at every part of it.

After the trap and dustbin lid had been placed in position, and we had been " sealed in " it was at once apparent that the trap let in far more light than we had imagined. Looking up at the six inch opening covered with its gauze cone was rather like looking at the port hole of a ship. The whole pit was very fairly illuminated and I think we could have read a newspaper with comparative ease 10 feet or so away from the trap end.

Here it should be noted that it is very necessary when constructing the sides of the hut which covers the pit, to leave windows in the sides near the trap so as to let bright light fall directly on it. Half sides for four feet and half open end let in enough.

We then went and scrutinised the filling orifice from below. It could be plainly observed that there was a comparatively large line of light all round the dustbin lid, even though the lid was a new and apparently tight one.

The reflection from the zinc made the line of light look very plain.

This proved definitely to me why those 20 or so flies had come out. They had been side tracked.

Looking down on the same pit from the outside through the gauze cone it seems as if one were looking into black darkness, but this is not really the case, as our experience proves.

I called to my African Inspector to throw his coat on the lid, which he did, making complete darkness. This experience caused me to devise the extra canvas or sacking cover, and the dividing partition. Any pit filling orifice can now be opened and no flies come out ; all being at the lighted trap end or caught in the trap.

A further improvement which I am now using is to divide the hut into two compartments. The one where filling takes place is kept dark and the other as light as possible.

The darkness of the filling chamber compensates for an ill fitting or badly adjusted lid.

It is very necessary to keep the filling orifice at least 8 to 10 feet from the trap so that any " loose flies " at the trap will not notice that the pit is open.

The fly trap on these pits has proved itself a success—one can with practical certainty state that all flies that hatch out go into the trap.

The first trap we put into position caused much excitement and interest, as I was not quite certain if my theory of " light attraction " for flies would prove correct. The happiest results followed—the gauze covered trap became almost immediately filled with a mass of humming flies, *steadily increasing in number* and anxious to get out. It was very interesting to notice that some four or five hours later many flies were lying dead on the floor of the trap, thus showing that if the insect does not get nourishment almost immediately after hatching out, it will die.

So far as I know, the principle of making an artificial point of light in such pits is a new one, making use as it does of the natural attraction that light has for the fly at this stage.

It can easily be used, with modification, in many other such places to prevent flies escaping.

For example, it can be applied to manure heaps, by placing the manure in any dark pit and having a light-tight opening and trap at the other end.

Be it noted, the artificial point of light may be sited anywhere—*i.e.* top, side or ends.

On looking at a trap some four or five days later which had been placed on a pit that had been in use some time, one could hear the humming of the flies in it as one approached. When one looked into it there was to be seen on the floor, a densely packed mass of dead and dying flies, probably an inch or more in depth. The remainder of the box contained a myriad of buzzing flies, all of which of course, die, and cannot complete their cycle of existence.

I removed one trap which had been in position some five to six weeks, and which contained a really dreadful looking multitude of flies.

I took it off and substituted another for two reasons :—

- (a) to do an actual count of the number of flies it contained.
- (b) to classify them and determine their relative proportions.

As to the actual numbers, let not the reader think that I am exaggerating, the count was made by three people. We measured three and a half gallons of flies.

Assuming that Byan and Archibald, page 210 Volume 1 is correct in stating that there are 10,000 flies to a pint, then in that trap were 276,000 flies—a number which appals one. How many would they have bred if they had escaped ?

Other traps in position promise even better results ; they are all filling in the same way.

One trap can with difficulty be seen into as there are so many flies inside the gauze.

It was a very large heap of flies to look at when spilled out on to newspapers and somewhat took us aback, about 2,000 flies were closely scrutinised taking samples at random from the heap with the following results :—

Four species were identified :—

- (1) *Lucilia Caesar* (green Bottle)
- (2) *Calliphora Vomitoria*
- (3) *M. Domestica*
- (4) *Sarcophaga*.

Lucilia Caesar and *Calliphora Vomitoria* predominated in about equal numbers ; then followed *M. Domestica*. The two former were about 20 times as numerous as the house fly. Only two specimens of the *Sarcophaga* were found.

It is obvious that such traps can be used for scientific investigation to classify flies bred in excreta, and to determine the bacteria etc. carried by them ; in addition to which invaluable information can be obtained as to the length of time to breed out etc. Up to date, here, I have determined that flies breed out in some 11 days ; this fact being ascertained by putting a trap on a newly opened pit.

To change a full trap for an empty one, the procedure is as follows :—when it is dark the new trap is taken to the pit and a hurricane lamp is placed 10 to 15 feet away— the less light there is the better.

The full trap is lifted gently and a piece of sacking or cloth inserted under it edgewise.

The new trap is held ready in the hands of an assistant. On the word “ Go ! ” the old trap is whisked off and the new one is on it about two seconds.

The change can equally well be made in daylight by fitting a shutter under the trap so as to temporarily close the pit. The idea is not pleasing that any of the flies should escape and settle on oneself.

Some interesting facts are emerging. One trap for example contained a great number of flies. A variety of minute black ant found them out, passed through the gauze and then proceeded to pull dead and dying flies to pieces and take them back through it. My mind was thus relieved of any chance of that trap over-filling.

The next stage in the same trap is still more interesting. There are no flies in it at all, but instead the trap is full of hundreds of cockroaches, and the under side of the gauze cone is covered with a mass of these intelligent but very repulsive insects waiting to come out.

Another trap contained thousands of flies ; then came the cockroaches who presumably ate them, as they vanished.

It appears therefore certain, that cockroaches breed in these pits.

Their appearance in the trap is too disgusting, while when disturbed, the rustle on their wings is revolting to a degree.

I have not yet arrived at a precise solution of the above problem in natural history. These are the only traps in which cockroaches are present. All others are full of flies.

Many visitors, consisting of Ladies, Doctors and Laymen have been to see these pits. All have been equally horrified at what I have shown them.

All agree that there is no offensive odour whatever, and only a very faint mouldy smell can be detected under the roof. It is thus apparent that the system is one suitable for use near private dwellings ; and I am now so using it for groups of bungalows.

One official near to whose bungalow I placed one in full view went out and closely examined it in my absence. Some days later he asked me what the erection was and what I did there !!

Another laymen, whom I brought to see one of these pits, came under the roof and, standing in the middle, looked at the whole construction but could only make a guess as to what purpose it served. All he could venture was that it was hollow underneath and that “ I put something there.”

The above two examples speak for themselves.

Experiments are still proceeding with regard to fly breeding, etc.

I wish to thank Dr. G. Hungerford, the Honourable the Acting Director of Medical and Sanitary Services, Gold Coast, Accra, together with Dr. G. J. Pirie, Deputy Director of Sanitary Services, Gold Coast, Accra, for the personal encouragement I have received in my experiments.

My thanks are also due to Dr. W. A. Young, the Director, Medical Research Institute, Accra, for his help in classifying flies.

A. L. OTWAY, MAJOR, R.A.M.C.,
Medical Officer of Health.

ADDENDUM.

Since this Annual Report has gone to press a despatch has arrived from the Secretary of State on the subject of 'Statistics of invalidings of European Officers' as recorded in the Annual Medical and Sanitary Reports of the various West African Colonies.

In this despatch the Secretary of State points out that it is nowhere made clear what exactly is held to constitute an 'invaliding' for the purpose of Statistics and then gives the following definition :—

"Invalided from the Colony" means that the official 'has been granted leave out of West Africa *because* a Government Medical Officer or a Government Medical Board has reported that his further residence in the Colony is likely to endanger his life or be prejudicial to his health or that his health is such as to interfere with the efficient performance of his duties.'

and adds

'The question whether an official is to be regarded as invalided does not depend on whether he has or has not served a certain number of months. For example an official who is granted leave on any of the above grounds will be considered to be "invalided", although he may have completed 12 months residence under the old, or 18 months under the new, leave regulations.'

The Secretary of State then gives instructions that the form given below (which has been filled in with the correct figures for the Gold Coast for the year under consideration 1924-25) shall be in future used.

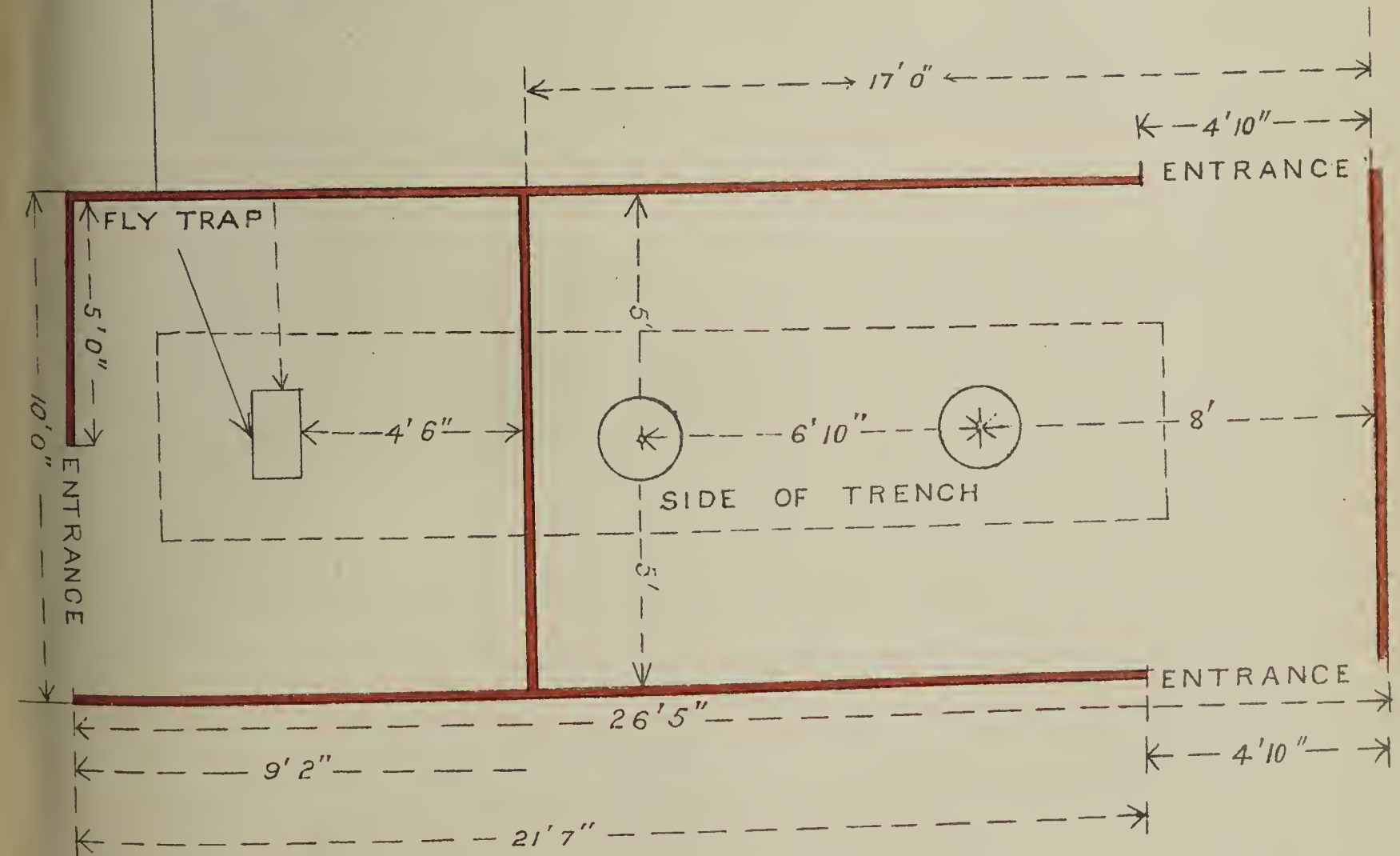
Serving under.	Residential Service.					
	Under 6 months.	6 but under 9 months.	9 but under 12 months.	12 but under 15 months.	15 but under 18 months.	18 months and over.
Old Leave Regulations ..	2	3	6	2	2	
New Leave Regulations ..	7	7	5	8	14	2

Total invaliding under Old Leave Regulations 15.

Total invaliding under New Leave Regulations 43 Grand total 58.

WITH TWO FILLING ORIFICES.

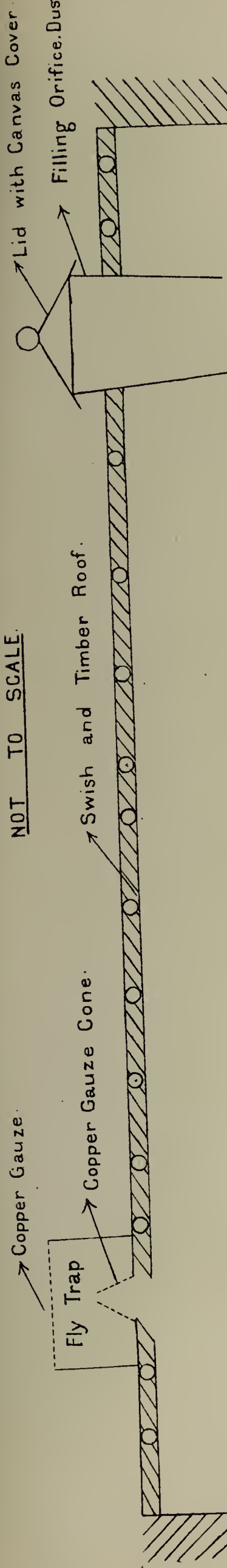
A perspective drawing of a long, low building, possibly a greenhouse or a storage shed, with a gabled roof. The building is divided into many rectangular sections by a grid of lines. The roof is covered with a dense, textured material, and the side wall is also covered with a similar material. The text "RUSHES AND BUSH STICKS" is written on the roof and the side wall, with an arrow pointing to the side wall.



PLAN

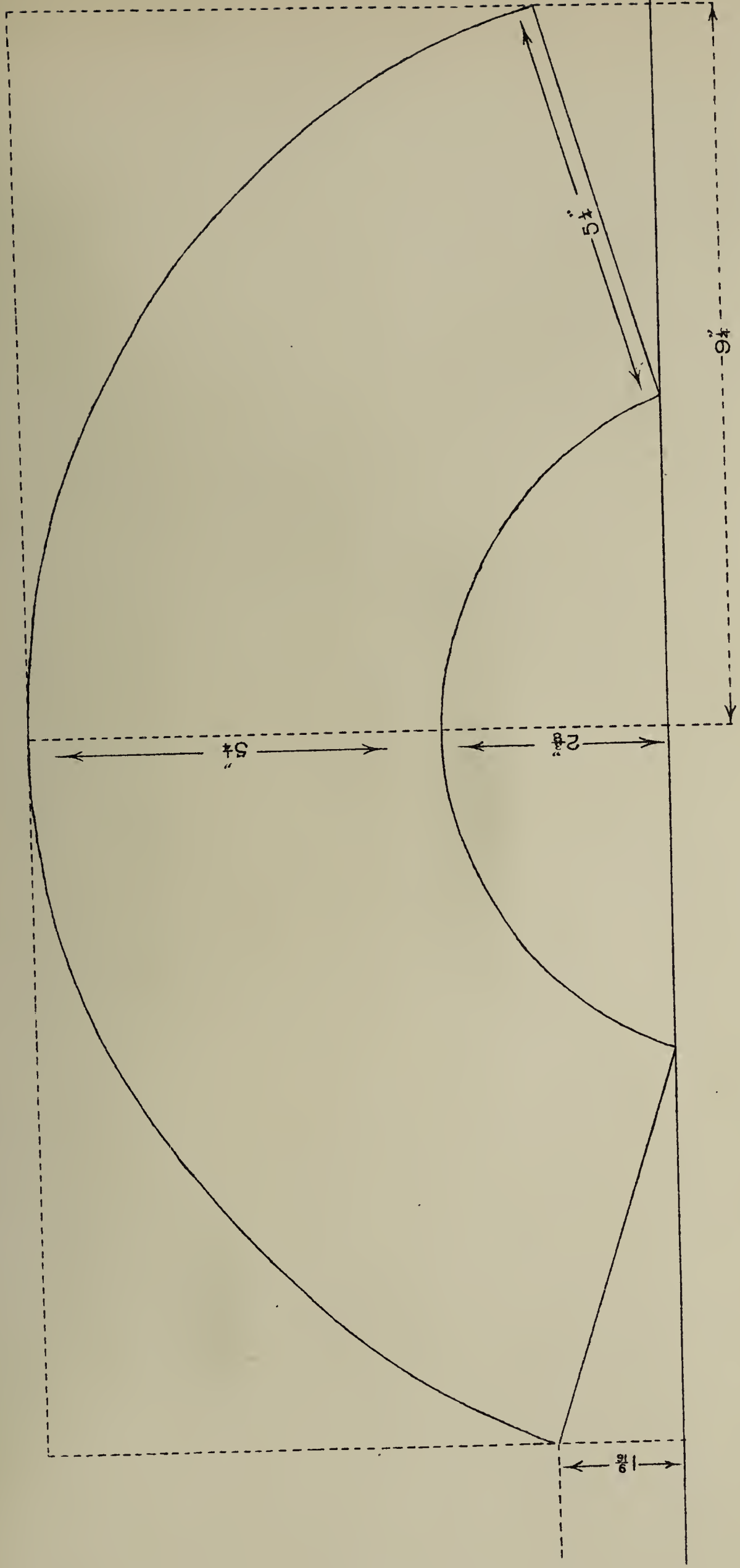
"FLY TRAPPED" PIT FOR EXCRETA DISPOSAL.

NOT TO SCALE.



DEEP PIT 20' X 3'-6" X 14'.

HALF SCALE PATTERN FOR GAUZE CONE



Scale of inches 0 $\frac{1}{4}$ $\frac{1}{2}$ $\frac{3}{4}$ 1 2 3 4 5

FLY TRAP. DETAILED SKETCH.

ELEVATION.

Copper Gauze.

Batten all round.

8 Gallon wood petrol case.

Gauze covered openings in
sides of 9" X 6" ends 4" X 3".

Copper Gauze Cone

Heaped up earth or swish.
to seal edge.

Earth and Timber roof

PIT.

Drawn and Printed at Survey Hd. Qrs Accra 1925.

